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CLIMATE CHANGE, CONSUMPTION, AND CITIES

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Abstract

Part I of this Article highlights the nation's high level of energy consumption and argues that policies directed solely at tailpipes and smokestacks will fail to reach climate change goals. Part II of this Article observes that recently proposed federal legislation does not sufficiently address consumption. Part III argues that direct local land use and green building measures can and should play a critical role in reducing demand. Part IV recognizes that, notwithstanding the institutional and practical arguments in favor of local initiatives, significant barriers could slow their adoption and implementation. Part V argues that federal legislation could overcome obstacles to local action by adopting a vertically integrated approach. Part VI argues that land use policy reforms will not succeed unless we confront the underlying social, economic, and political causes of existing sprawl

KEYWORDS: VMT, energy consumption, GHG, green house gas, ghg

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INTRODUCTION

As proposals for federal climate change legislation proliferate, national policymakers are focused on a cap-and-trade program for controlling greenhouse gas (“GHG”) emissions. I argue that successfully reducing U.S. greenhouse gas emissions will require reductions in energy consumption, and that a trading system’s market signals will be insufficient to prompt the widespread transformations in land use and building efficiency necessary to reduce energy demand.

Nor will federal action alone suffice. Familiar federalism principles suggest why cities and regional entities present distinct institutional advantages in addressing consumption given the key role of local land use and “green” building strategies in reducing demand. Notwithstanding many cities’ active endorsement of ambitious climate change goals, most cities are unlikely to act solely on their own initiative. The challenge for federal lawmakers is to design a vertically integrated climate change policy that establishes and coordinates the federal, state, and local role in reducing energy consumption.

Given the interrelatedness of environmental, political, social, and economic factors that are implicated in land use decisions, federal requirements for state and local governments to engage in land use planning to reduce vehicle-miles-travelled (“VMT”) must address the socioeconomic drivers of land use decisions. Focusing on socioeconomic factors is warranted not only as an instrumental mechanism for increasing the success of VMT-reducing reforms. As state and local governments open the door to new metropolitan visions, they create a unique opportunity to achieve regional equity.

Part I of this Article highlights the nation’s high level of energy consumption and argues that policies directed solely at tailpipes and smokestacks will fail to reach climate change goals. High emissions are a consequence of high demand, and policies to reduce demand, like green building requirements and land use reforms that reduce VMT, will be necessary to reach emission reduction goals.

Part II of this Article observes that recently proposed federal legislation does not sufficiently address consumption. While many of the federal bills

propose market mechanisms that are likely to generate price signals that could incentivize less sprawling growth and greener buildings, Part II identifies numerous obstacles to generating sufficient change through the market alone.

Part III argues that direct local land use and green building measures can and should play a critical role in reducing demand. Based on federalism principles, Part III provides an institutional justification for encouraging local and regional engagement in reducing consumption. Part III also highlights the ambitious climate change goals already established in hundreds of communities throughout the United States.

Part IV recognizes that, notwithstanding the institutional and practical arguments in favor of local initiatives, significant barriers could slow their adoption and implementation. Climate change presents classic collective action impediments. Moreover, land use measures like infill and compact development provisions are likely to encounter a thicket of political and social resistance. Some federal and state policies also impede—or create disincentives for—smart growth and green building objectives.

Part V argues that federal legislation could overcome obstacles to local action by adopting a vertically integrated approach. It proposes that the federal government assign emission reduction obligations to the states and then require the states to delegate emission reduction responsibilities to the regional or local level. This Article notes a number of difficult issues that such legislation would have to resolve, including the extent to which states should delegate responsibility to the local level, whether the responsibility should be delegated to the regional or the local level, and the extent to which the federal legislation should mandate program parameters or leave implementation to state or local discretion.

Part VI argues that land use policy reforms will not succeed unless we confront the underlying social, economic, and political causes of existing sprawl. Integrating socioeconomic considerations is critical not only to reducing VMT, but to enlightened decisionmaking. Principles of sustainable development suggest that, whenever key decisions impacting fundamental institutions are made, decisionmakers should integrate the critical environmental, economic, and social dimensions that their reforms necessarily implicate.

I. BEYOND SYMPTOMS: ADDRESSING CONSUMPTION

The politics of climate change regulation would certainly be easier if measures to address climate change could stop with industry.¹ Given the

1. This is not to say that the politics of regulating industry are easy.

carbon intensity of U.S. consumption, however, the United States is unlikely to be able to overcome its carbon addiction without measures that impact how and where we live, build, and consume.² The role of consumption in causing environmental impacts is not new, but national, state, and local approaches to air pollution historically have centered on direct emissions by regulating stationary sources and establishing automobile manufacturing requirements.³ The politics of addressing underlying community structures and individual lifestyles were simply too precarious.⁴ Now, however, the public's increasing recognition of the global peril posed by climate change could shift the political landscape and increase the political feasibility of consumption-reducing policies.

At almost twenty metric tons per capita of carbon dioxide per year,⁵ U.S. citizens have among the highest per capita GHG emissions in the world.⁶

2. See John Dernbach, *Stabilizing and Then Reducing U.S. Energy Consumption: Legal and Policy Tools for Efficiency and Conservation*, 37 ENVTL. L. REP. 10003, 10006-07 (2007); Michael P. Vandenberg & Anne C. Steinemann, *The Carbon-Neutral Individual*, 82 N.Y.U. L. REV. 1673 (2007) (arguing that climate change measures should facilitate the creation of climate-protection norms that would in turn motivate individuals to reduce their climate impact).

3. See Sudhir Chella Rajan, *Climate Change Dilemma: Technology, Social Change, or Both? An Examination of Long-Term Transport Policy Choices in the United States*, 34 ENERGY POL'Y 664, 674 (2006) (observing the history of a "technocratic" technology-based approach to controlling automobile emissions); Vandenberg & Steinemann, *supra* note 2, at 1688 (observing that most pollution control efforts have focused on industrial sources).

4. See Dernbach, *supra* note 2, at 10004 (observing reluctance to regulate energy efficiency and conservation due to its association with fundamental lifestyle choices and fears of hardship).

5. U.S. Energy Info. Admin., Table H.1co2, World per Capita Carbon Dioxide Emissions from the Consumption and Flaring of Fossil Fuels, 1980-2005 (Dec. 8, 2008), <http://www.eia.doe.gov/pub/international/iealf/tableh1co2.xls> [hereinafter Carbon Emissions Table] (listing 2006 U.S. carbon dioxide emissions of 19.78 metric tons per capita).

6. In comparison, the world average in 2006 was 4.48 metric tons of carbon dioxide per capita. *Id.* U.S. citizens are ultimately responsible for an even higher level of per capita emissions, since the per capita statistics address domestically-generated emissions, not the emissions associated with imported products. The U.S. trade deficit for goods was 74.9 billion as of July 2008, see U.S. CENSUS BUREAU, FOREIGN TRADE STATISTICS, U.S. INTERNATIONAL TRADE IN GOODS AND SERVICES HIGHLIGHTS (2008), <http://www.census.gov/indicator/www/ustrade.html>, revealing that U.S. consumption of imported goods is responsible for production and transportation-related emissions in other nations. A study evaluating the GHG emissions associated with goods imported into the United States from China concluded that, in 2003, U.S. carbon dioxide emissions would have been 6% higher if the United States had produced the items it imported from China, while Chinese emissions would have been 14% lower had it not produced goods for the U.S. market. UNIV. CORP. FOR ATMOSPHERIC RESEARCH, TRADE IMBALANCE SHIFTS U.S. CARBON EMISSIONS TO CHINA, BOOSTS GLOBAL TOTAL (2005), <http://www.ucar.edu/news/releases/2005/china.shtml>.

Canada and Australia are the only other major industrialized nations with per capita emissions like those of the United States. Canada's emissions in 2006 were 18.81 metric tons per capita, and Australia's were 20.58. The only countries with higher emissions are several

Other major industrialized nations in Western Europe and Asia have per capita emissions that hover around ten metric tons per capita of carbon dioxide per year,⁷ or about half the level of U.S. per capita emissions. While country-specific factors no doubt impose constraints, these numbers suggest that it is possible to reduce per capita emissions without a drastic reduction in the standard of living.

To reduce per capita emissions, and particularly to reduce emissions from certain sectors, climate change policy must address not only direct emissions, but also the consumer demand that drives them.⁸ In other words, climate change policy must address causes as well as symptoms.⁹ Although GHG emissions are impacted by virtually every facet of industrial society, this Article focuses on the land use and building sectors because of their significant GHG contributions and the critical role of local governments in addressing them.¹⁰

small oil-producing nations (Bahrain at 38.44 per capita, Qatar at 61.19 per capita, and United Arab Emirates at 35.05 per capita), as well as a number of small-island states that most likely experience high levels of travel (Netherlands Antilles at 49.13 per capita and U.S. Virgin Islands at 118.30 per capita). Carbon Emissions Table, *supra* note 5.

7. Carbon Emissions Table, *supra* note 5. Measured in metric tons, in western Europe, Austria's 2005 per capita emissions were 9.55, Belgium's were 13.10, Denmark's were 9.38, France's were 6.59, Germany's were 10.24, Greece's were 9.67, Italy's were 8.03, the Netherlands' were 16.44, Norway's were 11.40, Spain's were 9.60, Sweden's were 6.53, Switzerland's were 6.13, and the United Kingdom's were 9.55. In Asia, Japan's 2005 per capita emissions were 9.65 and South Korea's were 10.27. *Id.* It is worth noting, in comparison, that China's 2005 per capita emissions were 4.07, a fifth of those of U.S. citizens, and India's were 1.07, 5% of the U.S. per capita emissions. *Id.*

8. See JOHN HOLTZCLAW, 2004 ACEEE SUMMER STUDY ON ENERGY EFFICIENCY IN BUILDINGS, A VISION OF ENERGY EFFICIENCY 2 (2004) ("Utility energy efficiency targets, appliance and vehicle standards, building codes, and land use planning inducements should all be among the basic elements of any federal climate bill."); Dernbach, *supra* note 2, at 10006 (stating that encouraging energy efficiency and conservation addresses "the core problem" of consumption).

9. Michael Vandenberg and Anne Steinemann observe that "[t]he framing of pollution sources exerts a powerful influence on the regulatory and social forces brought to bear on them." Vandenberg & Steinemann, *supra* note 2, at 1688. If industry, utilities, and vehicles are viewed as the "source" of emissions, then regulatory efforts focus on facility and vehicle emission-reduction technology or alternatives. *Id.* In contrast, if individuals themselves are viewed as significant emitters due to their consumption patterns, then regulatory strategies are more likely to focus on how to reduce consumption and increase individual energy efficiency, rather than focusing exclusively on large sources. *Id.*

10. Professors Vandenberg and Steinemann focus on individual behavior itself as a mechanism for reducing consumption. See *id.* Professor Dernbach similarly observes the important role of individual decisions in determining consumption: individuals decide how much to drive, how much to buy and use energy-consuming appliances, the size of their homes, and the degree to which they heat and cool them. See John C. Dernbach, *Overcoming the Behavioral Impetus for Greater U.S. Energy Consumption*, 20 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 15, 21-23, 25-27 (2007) [hereinafter Dernbach, *Overcoming the Behavioral Impetus*] (describing appliance use, consumption challenges in buildings, and

A. Land Use and Transportation

As of 2005, transportation-related emissions contributed one-third of the nation's carbon emissions.¹¹ Over half of the transportation-related emissions result from personal trips, 30% by automobiles and 27% by light trucks (including sports utility vehicles).¹² Reducing emissions per vehicle is a key strategy for reducing transportation-related emissions,¹³ but reductions in individual vehicle emissions will not sufficiently reduce net transportation emissions if Americans maintain or increase their VMT.¹⁴

vehicle choices and use); *see also* John C. Dernbach, *Harnessing Individual Behavior to Address Climate Change: Options for Congress*, 26 VA. ENVTL. L.J. 107 (2008) [hereinafter Dernbach, *Harnessing Individual Behavior*] (discussing the importance of policies to encourage reductions in individual consumption). While their proposals insightfully recognize the critical role of individual consumption decisions, my focus in this article is on creating the infrastructure that would enable individuals to consume less, rather than on the individual choices themselves. As Vandenberg and Steinemann observe, existing urban infrastructures and consumer markets do not always allow individuals to exercise climate protection norms: individuals may live too far from work or transit to easily reduce vehicle use, or they may not have adequate information or options to purchase energy-efficient homes or appliances. Vandenberg & Steinemann, *supra* note 2, at 1716.

11. MARILYN A. BROWN ET AL., BROOKINGS INST., *SHRINKING THE CARBON FOOTPRINT OF METROPOLITAN AMERICA* 8 (2008).

12. *Id.* Another 20% consists of truck traffic. The remaining transportation emission sources include air, rail, water, and bus transit. *Id.*

13. Vehicle emissions of GHGs could be reduced in two ways: increasing fuel economy and decreasing the carbon content of automobile fuels. *See* REID EWING ET AL., URBAN LAND INST., *GROWING COOLER: THE EVIDENCE ON URBAN DEVELOPMENT AND CLIMATE CHANGE 2* (2008).

Title I of the Energy Independence and Security Act of 2007 increased vehicle efficiency standards, an increase likely to indirectly reduce carbon emissions. *See* Pub. L. No. 110-140, 121 Stat. 1492 (2007). In 2002, California passed legislation to directly control vehicle GHG emissions. CAL. HEALTH & SAFETY CODE § 43018.5 (West 2006). At least eleven other states have stated that they would adopt California's standards, and six additional states have expressed interest in doing so. *See* AIR RES. BD., CAL. ENVTL. PROT. AGENCY, FACT SHEET ON CLIMATE CHANGE EMISSION CONTROL REGULATIONS 3, http://www.arb.ca.gov/cc/factsheets/cc_newfs.pdf (last visited Jan. 20, 2009). Although the EPA did not allow California to move forward with its standards, *see* Zachary Coile et al., *EPA Blocks California Bid to Limit Greenhouse Gases from Cars*, S.F. CHRON., Dec. 20, 2007, at A1, it is possible that the Obama administration would allow California's standards to be implemented.

Title II of the Energy Independence and Security Act of 2007 calls for increasing the use of biofuels. The potential for biofuels to reduce net GHG emissions depends upon the feedstock, with some biofuels predicted to reduce net GHG emissions (for example, cellulosic ethanol) while others are predicted to generate little if any reductions (such as corn ethanol). *See* BRENT D. YACOBUCCI, CONG. RESEARCH SERV., FUEL ETHANOL: BACKGROUND AND PUBLIC POLICY ISSUES 16-17 (2007). California has adopted a low-carbon fuel standard specifically intended to reduce net carbon emissions. *See* Exec. Order No. s-01-07 (Jan. 18, 2007), available at <http://gov.ca.gov/index.php/print-version/executive-order/5172/>.

14. The nation's earlier effort to control traditional air pollutants provides a case in point. The 1970 Clean Air Act required automakers to reduce certain traditional pollutant emissions by 90%, *see* 42 U.S.C. § 7521(b)(a)(A), a requirement that was met in the early

VMT is heavily influenced by underlying land use patterns and transportation infrastructure. U.S. land use patterns are characterized by low-density sprawling development.¹⁵ With the outward expansion of low-density suburbs and exurbs throughout the twentieth century, U.S. residents began to drive increasing distances as the circumference of metropolitan areas grew.¹⁶ The U.S. pattern of low-density residential growth has been heavily car-dependent, resulting in sharply increasing levels of VMT and associated vehicular emissions.¹⁷ From 1969 until 1990, VMT increased by 82% while the U.S. population increased by only 21%.¹⁸ From 1970 until 2005, average household VMT increased from 16,400 miles to 24,300, even though average household size fell.¹⁹

Although concerns about the environmental and social consequences of sprawl have launched a “smart growth” movement over the last twenty years,²⁰ the U.S. pattern of expanding sprawl and increasing VMT has not dramatically abated. For example, from 1990 until 1997, housing stock in low-density metropolitan counties increased at a faster rate (15%) than in high-density urban cores (5%).²¹ A recent study of land use and climate notes that “[t]he U.S. Department of Energy’s Energy Information Administration (EIA) forecasts a 48 percent increase in driving between 2005 and 2030 . . . outpacing the projected 23 percent increase in population.”²²

As a consequence of continuing sprawl, transportation-related emissions are not expected to decrease notwithstanding recent federal legislation to

1980s. See ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 566 (5th ed. 2006). Notwithstanding that laudable success, overall emissions did not significantly change since individual vehicle emission reductions were largely offset by large increases in VMT. *Id.* at 562.

15. See EWING ET AL., *supra* note 13, at 2-3, 21. “Sprawl” is a complex phenomenon that is not reducible to any single variable. Key attributes of sprawl include low density, separation of uses, lack of concentrated employment, residential, or other activity centers, and large block size with poor access. See *id.* at 60.

16. See *id.* at 21; Edward H. Ziegler, *Urban Sprawl, Growth Management, and Sustainable Development in the United States: Thoughts on the Sentimental Quest for a New Middle Landscape*, 11 VA. J. SOC. POL’Y & L. 26, 31-32 (2003).

17. Ziegler, *supra* note 16, at 31-33.

18. *Id.* at 32 (citing PETER CALTHORPE, THE NEXT AMERICAN METROPOLIS 47 (Chris Dresser & Doug Foster eds., 1993)); see also EWING, ET AL., *supra* note 13, at 21 (noting that VMT has grown three times faster than population).

19. BROWN ET AL., *supra* note 11, at 8.

20. See Patricia Salkin, *Squaring the Circle on Sprawl: What More Can We Do? Progress Toward Sustainable Land Use in the United States*, 16 WIDENER L. REV. 787, 788-90 (2007).

21. Ziegler, *supra* note 16, at 30. A complex set of legal, political, economic, and social factors have contributed to the nation’s sprawl. Insightful descriptions of these factors can be found in Ziegler, *supra* note 16, at 32-36.

22. EWING ET AL., *supra* note 13, at 43.

improve fuel efficiency and increase the use of biofuels. The Energy Independence and Security Act of 2007's fuel efficiency standards are expected to increase fleet-wide fuel economy by 34% by 2030,²³ and its biofuel requirements are expected to reduce lifecycle GHG emissions by 10% by 2025.²⁴ Although the combination of these measures would decrease net vehicular GHG emissions from cars and light trucks by 23% by 2030 if VMT levels stayed constant,²⁵ projected increases in VMT will result in little net decrease in emissions.²⁶ Thus, while fuel efficiency measures may prevent increases in net transportation emissions, they will not reduce emissions overall unless VMT is simultaneously controlled.²⁷

There is little question that existing VMT is correlated with the degree of sprawl. Numerous studies of metropolitan areas indicate that households in areas with greater residential density, greater employment density, mixed land uses, and good access to public transit have lower VMT.²⁸ In a recent study of the carbon footprints of the nation's 100 largest metropolitan areas, Professor Marilyn Brown and her colleagues observed that metropolitan areas with high density development patterns and rail transit tended to have lower carbon emissions than other cities.²⁹

While the correlations are not without controversy, changing future land use patterns is likely to lead to future reductions in VMT and its associated

23. *See id.* at 3, 43.

24. *Id.* at 43.

25. *Id.*

26. *Id.* at 4, 44. The study projects that by 2030, net emissions will have remained virtually constant at 2005 levels due to increases in VMT.

27. *See id.* at 2, 4 (stating that "technological improvements in vehicles and fuels are likely to be offset by continuing, robust growth in VMT" and that "the United States cannot achieve . . . large reductions in transportation-related CO₂ emissions without sharply reducing the growth in the number of miles driven"). Ewing and his co-authors assume that, overall, the transportation sector would have to reduce emissions by 33% to achieve climate stabilization goals. *Id.* at 114.

28. BROWN ET AL., *supra* note 11, at 12 (citing HOLTZCLAW, *supra* note 8); MARY JEAN BÜRER ET AL., LOCATION EFFICIENCY AS THE MISSING PIECE OF THE ENERGY PUZZLE: HOW SMART GROWTH CAN UNLOCK TRILLION DOLLAR CONSUMER COST SAVINGS (2004), *available at* http://docs.nrdc.org/air/files/air_06031001a.pdf; EWING ET AL., *supra* note 13, at 6 (describing studies showing reduced VMT in more compact cities); *id.* at 55-56; EDWARD L. GLAESER & MATTHEW KAHN, POLICY BRIEF: THE GREENNESS OF CITIES (2008), *available at* http://www.hks.harvard.edu/rappaport/downloads/policybriefs/greencities_final.pdf (summarizing preliminary results of a nationwide study analyzing energy use in metropolitan areas).

29. BROWN ET AL., *supra* note 11, at 22-25. Residential density and access to rail transit are, of course, not the only factors relevant to a municipality's total carbon footprint. The Brown study observed that a region's weather, its fuel mix, and fuel prices were also highly relevant. *Id.* at 25-26; *see also* GLAESER & KAHN, *supra* note 28 (evaluating a variety of factors affecting a metropolitan area's greenhouse gas emissions).

carbon emissions. In theory, land use reforms that require localities to eliminate their sprawl-inducing zoning codes and provide appropriate incentives could lead to increased density, infill development, mixed uses that lessen the distance between work, home, shopping, and other activities, improved access among important travel points, and neighborhood designs that facilitate access to public transit, walking, and bicycle use. Advocates hope that such changes would both reduce the extent of automobile use (by shortening distances and decreasing frequency) and change travel mode by leading more people to use public transit, bike, or walk instead of driving.

Professor Reid Ewing and his co-authors have identified six critical factors for determining the impact of land use changes on future carbon dioxide emissions from the transportation sector: (1) compact development's market share, relative to more sprawling development; (2) the extent to which compact development reduces per capita VMT; (3) the level of compact new development relative to the existing base of more sprawling development; (4) the degree of urbanization, since compact development primarily affects urban VMT; (5) the extent to which reductions in VMT are correlated with reductions in carbon emissions; and (6) the proportion of motor vehicle travel within overall transportation emissions, since land use changes would not affect rail, ship, or airline emissions.³⁰

Based on the foregoing factors, Ewing and his co-authors predict that increasing compact development relative to sprawl would reduce VMT by 10% to 14% and reduce the U.S. transportation sector's carbon dioxide emissions by 7% to 10% by 2050.³¹ They reach this conclusion by assuming, under the first factor, that 60% to 90% of new development will be compact.³² Under the second factor, they assume that compact development could reduce per capita VMT by 20% to 40%, with the variation depending upon its design.³³ Key variables would be the development's density, diversity of uses, urban design, destination accessibility, and distance to transit.³⁴ For the analysis, the authors assume that the average per capita

30. See EWING ET AL., *supra* note 13, at 32.

31. *Id.* at 35. Other studies suggest a more dramatic impact on GHG emission reductions, projecting that increased density could lead to a 10% reduction below 2001 emissions within ten years. See BROWN ET AL., *supra* note 11, at 12.

32. EWING ET AL., *supra* note 13, at 32-33. Professor Ewing and his colleagues suggest that land use will follow market demand. However, existing zoning provisions interfere with the market's ability to respond to demand because they mandate low density and separate land uses. See generally JONATHAN LEVINE, ZONED OUT: REGULATION, MARKETS, AND CHOICES IN TRANSPORTATION AND METROPOLITAN LAND-USE 23 (2006) (arguing that existing zoning impedes market demand for denser development). Existing zoning restrictions would have to be modified to enable the degree of compact development they propose.

33. EWING ET AL., *supra* note 13, at 33.

34. *Id.*

VMT reduction would be 30%.³⁵ Under the third factor, the authors note that the existing housing and commercial building stock is likely to be extensively expanded and replaced by 2050.³⁶ They assume that, by 2050, 66% of the built environment will be new or rebuilt.³⁷ Under the fourth factor, they assume that the percentage of VMT generated from urban (rather than rural) sources will grow from the current 66% to 80%, given the increasing trend toward urbanization.³⁸ Under the fifth factor, they predict that the VMT associated with compact development could lead to slightly higher carbon emissions per mile travelled because city driving generates greater emissions per mile than long-distance driving.³⁹ The authors therefore assume that, for every reduction in VMT, carbon dioxide emissions will be reduced by only 90%.⁴⁰ Finally, under the sixth factor, the study authors assume that the proportion of travel associated with motor vehicles (rather than air, ships, and trains) will increase slightly from 79% in 2005 to 80% by 2050.⁴¹

While there is little controversy over the connection between existing urban form and high levels of VMT, some have questioned whether future land use changes would, in fact, reduce VMT.⁴² If anti-sprawl land use reforms do *not* lead to decreases in VMT—if the American public proves wedded to its automobiles and long distance travel regardless of urban form—then land use reforms, whatever their intrinsic merit, would not be justified by climate benefits.⁴³

35. *Id.*

36. *Id.* at 33-34. In the housing sector, Ewing and his co-authors predict that more than 70% of the 2005 housing stock will be new or replaced by 2050. *Id.* at 33. In the nonresidential sector, Ewing and his co-authors predict that, by 2050, sixty billion square feet will be added to the existing 100 billion square feet and that 130 billion square feet will be rebuilt. *Id.* at 34. Some of the new construction will also be rebuilt before 2050. *Id.* at 33.

37. *Id.* at 34.

38. *Id.*

39. *See id.* at 45-46, 56, 81 (observing that vehicle trip frequencies could increase emissions per mile due to the additional emissions resulting from cold starts and that vehicles tend to emit more per mile at speeds below forty-five miles per hour).

40. *Id.* at 34-35. The emissions reduction benefits of VMT reduction clearly outweigh the slight increase in emissions resulting from density-induced congestion. *See id.* at 56, 81.

41. *Id.* at 35.

42. *See* LEVINE, *supra* note 32, at 23. As one study has stated: “It is one thing to say that cities of different urban form have different patterns of energy consumption and a quite different thing to assume that realistic policies can turn an inefficient city into an efficient one.” ELENA SAFIROVA ET AL., SPATIAL DEVELOPMENT AND ENERGY CONSUMPTION 8 (2007).

43. *See* SAFIROVA ET AL., *supra* note 42, at 31. Given their skepticism that land use policies could reduce VMT, Safirova and her colleagues conclude that “[p]olicies with the main goal of reducing energy consumption should be national, not local . . . [and that local governments should] leave the energy policy to federal and international entities.” *Id.*

The greatest controversy centers on Ewing's second factor: the extent to which smart growth measures such as increased density, mixed uses, planning to enhance accessibility, and neighborhood design would, in fact, reduce VMT. Many theoretical studies have evaluated this question, with some studies suggesting that greater density would lead to significant VMT reductions and others finding much more modest reductions.⁴⁴ Similarly, assessments of the impact of neighborhood design on VMT have had mixed results.⁴⁵

The studies that find little link between land use reforms and VMT reductions appear to paint an inaccurately pessimistic picture. They generally isolate the impact of individual factors, like density or neighborhood design, without considering the multiple characteristics necessary for compact development to reduce VMT successfully.⁴⁶ Professors Badoe and Miller have stated that studies that focus solely on density or neighborhood design "tend[] to ignore the critical question of connectivity: it is of little use having a dense neighborhood which does not have good access to relevant activity destinations."⁴⁷ Professor Bartholomew, in this colloquium volume, makes clear that accessibility is essential to reducing VMT.⁴⁸ As Professor Ewing and his colleagues suggest, a development's density, diversity of uses, destination accessibility, and distance to transit are all critical factors in reducing VMT.⁴⁹ Considering each factor in isolation is

44. See SAFIROVA ET AL., *supra* note 42, at 3-4; Daniel A. Badoe & Eric J. Miller, *Transportation-Land-Use Interaction: Empirical Findings in North America, and Their Implications for Modeling*, 5 TRANSP. RES. PART D 235, 248 (2000). Professor Ewing suggests that while the data are somewhat mixed, most studies find that changes in land use will lead to VMT reductions. EWING ET AL., *supra* note 13, at 65, 71. He suggests that the key issues are not whether the reductions will occur, but how and to what extent. *Id.* at 65.

45. See Badoe & Miller, *supra* note 44, at 252.

46. See *id.* at 251-52. For example, a study attempting to project the VMT impact of increasing density through infill in the D.C. metropolitan area focused on several policy options for reducing VMT, but generally considered only one or two variables at a time. They found that increasing density, or increasing density through a program designed to bring workers closer to their jobs, decreased trip distances, but had little, if any, net impact on VMT due to increasing trip frequencies. See SAFIROVA ET AL., *supra* note 42, at 16-26. However, the study did not consider land use changes that might have reduced trip frequencies, such as allowing mixed uses, or changes in public transportation that might have facilitated mode switching. It may have thus underestimated the potential long-term VMT impacts of more comprehensive policy approaches.

47. See Badoe & Miller, *supra* note 44, at 251-52.

48. See Keith Bartholomew, *Cities and Accessibility: The Potential for Carbon Reduction and the Need for National Leadership*, 36 FORDHAM URB. L.J. 159, 163-64 (2009).

49. See EWING ET AL., *supra* note 13, at 67-71; Bartholomew, *supra* note 48, at 174-82; *supra* note 28 and accompanying text. Badoe & Miller note that transit supply is also a critical factor in encouraging drivers' mode shift to public transit, but one that has rarely

likely to underestimate the reduction potential of a more integrated approach.⁵⁰

Critics of the land use-VMT connection also contend that early studies predicting that land use reforms would reduce VMT failed to consider the role of socioeconomic or demographic factors in predicting potential VMT reductions.⁵¹ Higher-income residents living in dense neighborhoods might continue to drive, notwithstanding convenient public transportation.⁵² Even if they live in dense neighborhoods, such residents are likely to continue to take advantage of the widely-dispersed amenities available in large metropolitan areas.⁵³ Professor Ewing and his colleagues have found that trip frequencies and mode choices probably are influenced by socioeconomic variables.⁵⁴ Trip length, however, is less determined by socioeconomic influences,⁵⁵ and, although mode choices are influenced by socioeconomic factors, non-automobile choices were more likely with higher densities and mixed uses.⁵⁶ Overall, their report concludes that recent studies that have controlled for “confounding influences” like socioeconomic status “still found strong relationships between urban form and VMT.”⁵⁷

Another critique of the studies showing a connection between land use and VMT is that they suffer from “self-selection” bias: they fail to prove that urban form itself, rather than preexisting preferences to reduce automobile use, lead to reductions in VMT.⁵⁸ In response, Professor Ewing argues that studies controlling for preexisting “bias” find VMT reductions regardless of individual preferences.⁵⁹ Moreover, Professors Ewing and

been considered in the land use-transportation studies to date. Badoe & Miller, *supra* note 44, at 254.

50. Based on an exhaustive review of the land-use-transportation literature, Professors Badoe and Miller argue that studies evaluating the impact of land use changes on VMT would be more accurate if they integrated the relevant components of land use reforms rather than considering each separately. *See* Badoe & Miller, *supra* note 44, at 260-61.

51. *See* SAFIROVA ET AL., *supra* note 42, at 5.

52. *See* Badoe & Miller, *supra* note 44, at 254 (reporting that socioeconomic factors, including income, age, gender, and occupation have an impact on travel behavior and residents’ likely responses to increasing density).

53. Moreover, even if greater density and mixed uses were promoted, it is often difficult for both wage earners in a two-earner family to live close to their work when they reside in large metropolitan regions. *See* William W. Buzbee, *Urban Sprawl, Federalism, and the Problem of Institutional Complexity*, 68 FORDHAM L. REV. 57, 72 (1999).

54. EWING ET AL., *supra* note 13, at 68.

55. *Id.*

56. *Id.* at 68-69.

57. *Id.* at 57; *see also id.* at 61 (describing a study showing that sprawl was a more significant predictor of VMT than other socio-demographic variables).

58. *See id.* at 91-94 (describing this critique).

59. *Id.* at 94.

Levine suggest that, even if self-selection does make a difference to the overall impact of urban form on behavior, considering automobile-reduction preferences could make studies more, not less, predictive of likely VMT changes.⁶⁰ If land use reforms create additional compact development that was formerly undersupplied by the market, then people seeking less automobile-dependent lifestyles are likely to gravitate toward such communities and reduce automobile use accordingly.⁶¹ Controlling for their pre-existing propensity to reduce automobile use would underestimate the importance of the land use changes that make it possible for them to realize their preferences.⁶²

Despite the complexity of determining the likely impact of land use changes on VMT, there is sufficient evidence to conclude that land use changes, if made in a comprehensive fashion with attention to the myriad factors impacting driving choices, could lead to significant VMT reductions. While it is true that those who can afford to do so may continue driving more than smart growth advocates hope, integrated planning, self-selection, and increasing awareness of the value of personal energy decisions may lead to greater reductions than skeptics predict.

Additional uncertainties surround Professor Ewing's carbon reduction predictions. For example, his prediction that, with appropriate land use reforms, 60% to 90% of new development will be compact could be optimistic.⁶³ He is undoubtedly correct that compact development will increase if obstacles to its development are removed, since there is strong evidence that compact development is currently undersupplied relative to market demand.⁶⁴ Nonetheless, it is not clear that the level of demand will support

60. *See id.* at 95-96; LEVINE, *supra* note 32, at 30-36.

61. *See* EWING ET AL., *supra* note 13, at 96 (observing that if compact development is currently undersupplied, as they argue it is, new development will attract those who want to reduce automobile use and lead to higher-than-anticipated reductions in VMT). Badoe & Miller state that "[i]ncreased residential density does not directly 'cause' reductions in auto VMT. Rather, under the right circumstances, it might attract a resident population with particular socioeconomic characteristics." Badoe & Miller, *supra* note 44, at 252-53. The authors contend that residents with certain "desired activity patterns" will make decisions that reduce VMT by more than they would have in a more sprawling urban form. *Id.*

62. *See* LEVINE, *supra* note 32, at 36 ("If the land-use effect works largely via self-selection, then a search for a residual pure effect would underestimate the potential impact of land use policy reform.").

63. Even if restrictions on compact development, like minimum density requirements, are removed, the government may be limited in its ability to induce developers to actually build denser, mixed-use communities. *See* LEVINE, *supra* note 32, at 19, 109-10.

64. *See id.* at 127-28 (reporting that most developers believe there is an inadequate supply of "alternative development" options relative to demand, and that local regulations are the primary obstacle to alternative development); *see also* EWING ET AL., *supra* note 13, at 94, 96 (noting that many Atlanta residents would prefer but were unable to find walkable

as high a ratio of compact to sprawling development as he and his colleagues predict,⁶⁵ or that the many challenges facing infill development will be overcome.

Another uncertainty is the future ratio between new and existing development. If there is little new development, then existing sprawl will largely determine future VMT even if most new development is compact. New compact development will impact VMT only if and when it constitutes a significant percentage of the building stock. If there is less turnover in the existing housing and commercial stock by 2050 than Ewing and his colleagues predict,⁶⁶ then land use reforms will have a smaller impact on transportation emissions than they predict.

Ultimately, however, whatever the uncertainties about the extent to which land use reforms would reduce VMT, it is clear that failing to reform land use and tolerating continued sprawl is fundamentally unsustainable.⁶⁷ While such reforms may not achieve as great a carbon reduction as Professor Ewing and his colleagues predict, *not* enacting the necessary reforms would inevitably result in higher VMT, and carbon emissions, than more compact and accessible development. Land use reforms are one strategy among many,⁶⁸ and are an important component of a broader strategy to reduce the transportation sector's emissions even if their relative contribution is somewhat uncertain.

B. Buildings and Energy Consumption

Existing air pollution policies and prospective climate change legislation focus on power plants, the source of 41% of the nation's carbon dioxide

neighborhoods and stating that there is "ample evidence" that current demand for "walkable, transit-oriented environments far exceeds the current supply").

65. Some scholars suggest that existing sprawl represents U.S. citizens' enduring preference for low-density suburban life, a preference that would remain unchanged even if denser development were permitted. See Buzbee, *supra* note 53, at 65-66 (describing surveys of citizen preferences for low-density suburban housing).

66. Conceivably, stricter building standards for new buildings could slow the turnover of the building stock. However, efficiency requirements on existing buildings would remove that disparity.

67. See LEVINE, *supra* note 32, at 3, 5-6, 48-49 (stating that uncertainty is inevitable, but does not provide a reason for reducing existing barriers to compact development).

68. Ewing and his colleagues make clear that land use policies alone will not "solve" the problem of climate change or the transportation sector's contribution to it. See EWING ET AL., *supra* note 13, at 114. They note that investments in public transportation, changing highway funding priorities, and market mechanisms to reduce driving could contribute to additional reductions from the transportation sector. *Id.* at 115.

emissions in 2006.⁶⁹ Undoubtedly, important gains can and must be achieved by direct utility emissions programs that promote a transition to renewable and less-polluting sources of energy. However, the electricity sector is unlikely to yield sufficient emission reductions without reducing consumer demand.⁷⁰ Buildings are a central component of that demand. Residential and commercial buildings consume 72% of U.S. electricity.⁷¹ In addition, buildings generate direct emissions through natural gas and fuel oil consumption.⁷² Increased energy efficiency in new buildings, existing buildings, and appliances could have a significant impact on the nation's electricity demand and its associated emissions, and is the lowest-cost mechanism available for reducing the electricity sector's emissions.⁷³

Improving energy efficiency and alternative energy measures in new buildings could significantly reduce, if not eliminate, the carbon footprint for new construction. In California, for example, the Public Utilities Commission and Energy Commission have set a goal of *zero* net energy use for residential buildings by 2020 and for commercial buildings by 2030.⁷⁴ Key players in urban architecture, like the American Institute of Architects and the U.S. Mayors' Conference, have similarly called for car-

69. See U.S. ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2006 ES-8 (2008), available at http://www.epa.gov/climatechange/emissions/downloads/08_ES.pdf.

70. Some might argue that demand does not need to be addressed because: (1) we could switch to carbonless nuclear power; or (2) we could develop carbon capture and sequestration ("CCS") technologies that eliminate the need to reduce carbon. Due to the environmental concerns presented by both of these options, I assume for purposes of this paper that they do not present viable alternatives to demand reduction. In addition, increasing energy efficiency is likely to be a much more certain and much less expensive approach than developing carbon capture and sequestration and nuclear power, suggesting that it should be pursued even if research and development of CCS and nuclear power continues. See MCKINSEY & CO., REDUCING U.S. GREENHOUSE GAS EMISSIONS: HOW MUCH AT WHAT COST? 60-62 (2007), available at <http://www.mckinsey.com/client/service/ccsi/greenhousegas.asp> [hereinafter MCKINSEY REPORT] (discussing the costs and uncertainties associated with CCS and nuclear power).

71. See Edna Sussman, *Reshaping Municipal and County Laws to Foster Green Building, Energy Efficiency, and Renewable Energy*, 16 N.Y.U. ENVTL. L.J. 1, 8 (2008) (citing U.S. DEP'T OF ENERGY, BUILDINGS ENERGY DATA BOOK §§ 1.1.3, 1.1.6).

72. See U.S. ENVTL. PROT. AGENCY, *supra* note 69, at ES-8.

73. See MCKINSEY REPORT, *supra* note 70, at xiv, 34 (stating that improving the energy efficiency of buildings and appliances could significantly reduce projected GHG emissions); *id.* at 28 ("[i]ncreased energy efficiency could reduce power load by some 24 percent"). The McKinsey Report also observes that, on a lifecycle basis, achieving energy efficiency has negative costs. *Id.* at 34, 69.

74. CAL. PUB. UTIL. COMM'N, CALIFORNIA LONG TERM ENERGY EFFICIENCY STRATEGIC PLAN: ACHIEVING MAXIMUM ENERGY SAVINGS IN CALIFORNIA FOR 2009 AND BEYOND 9, 30 (2008) [hereinafter CPUC PLAN].

bon-neutral buildings by 2030.⁷⁵ Even some within the building industry, an industry traditionally skeptical of environmental mandates, have embraced dramatic energy-use reduction goals for new construction.⁷⁶

The impact of these goals depends, in part, upon the extent to which the future built environment consists of new (green) versus existing (less green) buildings. Current estimates project significant increases in new and retrofitted buildings. The McKinsey Report, a comprehensive assessment of GHG abatement strategies, projects that by 2030, the commercial building stock will grow from seventy-three billion to 108 billion square feet, and residential homes will grow from 113 million homes to 147 million, a 30% increase.⁷⁷

Notwithstanding the likely significance of more energy-efficient new construction, the existing building stock will remain an important component of energy demand, with seventy-six million residential and five million commercial buildings.⁷⁸ Increasing energy efficiency in existing buildings could substantially reduce demand.⁷⁹ According to some studies, the majority of existing residences and commercial buildings are poorly insulated and retrofits could significantly increase their efficiency.⁸⁰ Generating energy-efficiency improvements and renewable energy investments in existing buildings presents numerous practical and political challenges, but remains an important step in reducing the nation's GHG emissions.

Demand-reduction measures in the land use and buildings context could thus play a key role in reducing the nation's greenhouse gas emissions. The next question is: to what extent have federal lawmakers directly or indirectly addressed consumption?

75. See Sussman, *supra* note 71, at 9.

76. The Home Builders Association of Northern California has supported the adoption of local building code ordinances for new construction requiring 50% less energy use than 1990 levels by 2020. Press Release, Home Builders Assoc. of N. Cal., Home Builders Association of Northern California Announces Support for Mandatory Green Building Standards in all Bay Area Communities (Jan. 14, 2008), *available at* http://www.hbanc.org/files/HBANC_CPUC_0.pdf.

77. See MCKINSEY REPORT, *supra* note 70, at 10, 34, 39; *see also* EWING ET AL., *supra* note 13, at 33-34 (predicting large increase in new and rebuilt residential and nonresidential building stock by 2050).

78. See Edna Sussman, *Building Stock Offers Opportunities to Foster Sustainability and Provides Tools for Climate Change Mitigation and Adaptation*, 7 SUSTAINABLE DEV. L. & POL'Y 17, 18 (2007).

79. See Dernbach, *supra* note 2, at 10029-30 (discussing studies assessing potential for energy efficiency improvements). For example, simply improving attic insulation in cold climates with older housing stock "could improve heating performance by nearly 30 percent" from business as usual. MCKINSEY REPORT, *supra* note 70, at 39.

80. See Dernbach, *supra* note 2, at 10018 (noting that 60% of existing residences and 70% of commercial buildings are inadequately insulated).

II. THE LIMITS OF EXISTING FEDERAL INITIATIVES

As I have argued elsewhere, federal legislation to address climate change is essential.⁸¹ This Part outlines the nature of federal proposals to date and the extent to which they directly or indirectly promote the types of land use and green building initiatives essential to reducing energy demand.

A. Proposed Federal Legislation

With the onset of a Democratic Congress in January 2007, members of Congress proposed a flurry of economy-wide climate change bills as well as more narrowly-tailored legislation with energy and climate change implications.⁸² Except as relevant, this Article focuses on the economy-wide legislation.

The proposed climate change bills typically set economy-wide GHG reduction goals over time⁸³ and authorize the Environmental Protection Agency (“EPA”) to develop a regulatory or market mechanism for reaching the targets. Traditional regulatory measures could include direct stationary source controls.⁸⁴ Direct controls are, however, unlikely to promote demand reduction if they are modeled after existing performance standards, which require emissions reductions per unit of production, rather than requiring reductions in production itself.⁸⁵ Under a performance standard, a

81. See Alice Kaswan, *A Cooperative Federalism Proposal for Climate Change Legislation: The Value of State Autonomy in a Federal System*, 85 DENV. U. L. REV. 791, 794-97 (2008) [hereinafter Kaswan, *Cooperative Federalism*].

82. See JONATHAN L. RAMSEUR & BRENT D. YACOBUCCI, CONG. RESEARCH SERV., CLIMATE CHANGE LEGISLATION IN THE 110TH CONGRESS 5-6, 11-12 (2007); Victor B. Flatt, *Taking the Legislative Temperature: Which Federal Climate Change Legislative Proposal Is “Best”?*, 102 NW. U. L. REV. 123 (2008).

83. See Flatt, *supra* note 82, at 128-29.

84. See Alice Kaswan, *The Domestic Response to Global Climate Change: What Role for Federal, State, and Litigation Initiatives?*, 42 U.S.F. L. REV. 39, 76 (2007) [hereinafter Kaswan, *The Domestic Response*]. Arguably, the Clean Air Act already provides the EPA with the authority to create GHG emission standards for new stationary sources, see Holly Doremus & W. Michael Hanemann, *Of Babies and Bathwater: Why the Clean Air Act’s Cooperative Federalism Framework Is Useful for Addressing Global Warming*, 50 ARIZ. L. REV. 799, 816-30, 832-33 (2008), but the Clean Air Act does not set standards for existing sources in attainment areas. The Supreme Court clarified the EPA’s authority to set GHG vehicle emission standards in *Massachusetts v. EPA*, 549 U.S. 497 (2007).

The climate legislation frequently includes additional provisions as well, including research, technology development programs, adaptation provisions, and other climate-change related programs. See RAMSEUR & YACOBUCCI, *supra* note 82, at 7-10; Flatt, *supra* note 82, at 146-47 (discussing technology research and development programs).

85. See Alice Kaswan, *Environmental Justice and Domestic Climate Change Policy*, 38 ENVTL. L. REP. 10287, 10300 (2008) [hereinafter Kaswan, *Environmental Justice*] (describing traditional rate-based emission standards).

utility could be required to reduce its per-unit carbon dioxide emissions, but would have no incentive to reduce overall energy production. Without an incentive to reduce production, it would not have an incentive to reduce demand.

National policymakers are considering a cap-and-trade system applicable to large emission sources.⁸⁶ Under a cap-and-trade program, the EPA would establish steadily decreasing annual emissions caps and distribute or auction emissions allowances to facilities included in the trading system. The allowances could be distributed to “upstream” fuel providers, such as oil or coal companies, based upon the carbon content of fuels, or “downstream” to facilities actually emitting GHGs. As discussed further below, this type of market mechanism could create indirect demand-reduction incentives.

Not surprisingly, Congress’s approach to the transportation sector has focused on vehicle efficiency and fuels,⁸⁷ not federally-mandated land use changes to reduce VMT. Past federal efforts to shape local land use policies to reduce air pollution generated strong protests from local governments.⁸⁸ Somewhat greater federal action is evident in the energy-efficiency context. The federal government has already passed appliance-efficiency legislation and encouraged states to improve their building codes.⁸⁹ In particular, the recently-passed Energy Independence and Security Act of 2007 addressed energy efficiency in residential, commercial, and federal buildings to a certain extent.⁹⁰ Congress does not, however, appear to be considering a full-fledged energy code to promote energy efficiency. Nonetheless, a national cap-and-trade program or other market

86. See Dernbach, *Harnessing Individual Behavior*, *supra* note 10, at 111-14; Flatt, *supra* note 82, at 135; see also LARRY PARKER & BRENT D. YACOBUCCI, CONG. RESEARCH SERV., GREENHOUSE GAS REDUCTION: CAP-AND-TRADE BILLS IN THE 110TH CONGRESS (2007).

87. See *supra* notes 23-24 and accompanying text (discussing the Energy Independence and Security Act of 2007 provisions increasing fuel economy and encouraging the use of biofuels).

88. See John P. Dwyer, *The Practice of Federalism Under the Clean Air Act*, 54 MD. L. REV. 1183, 1206 (1995) (describing local government opposition to early federal efforts to incorporate land use measures into federally-drafted clean air implementation plans).

89. See Dernbach, *Overcoming the Behavioral Impetus*, *supra* note 10, at 19-23 (describing federal appliance programs and federal requirements to encourage states to adopt more energy efficient building codes).

90. See Pub. L. No. 110-140, §§ 401-441 (2007). One of the more promising climate change bills, proposed by Senators Lieberman and Warner in the 110th Congress, included a requirement for states to adopt enhanced building energy efficiency standards. Lieberman-Warner Climate Security Act of 2008, S. 3036, 110th Cong., §§ 5201-5202 (2008). Sections 5101 to 5102 addressed appliance efficiency standards.

mechanism could potentially generate indirect demand-reducing mechanisms.

B. The Limited Role of the Market in Reducing VMT

In theory, a market mechanism could generate VMT reductions through increases in fuel prices. For example, if a cap-and-trade program required oil companies to buy allowances based on their fuel's carbon content, the price of gasoline could increase. Higher gasoline costs could encourage drivers to cut down on discretionary trips and induce those who have access to public transit to shift from cars to transit.⁹¹ There is some evidence that recent increases in gasoline prices have had precisely these effects.⁹² The resulting reductions in VMT are likely to be small, however, unless and until land use patterns and transportation systems reduce the need for extensive automobile use.⁹³ Conceivably, in the long term, increased gasoline costs could generate consumer demand for compact development and public transportation.⁹⁴ Housing developers could respond by increasing infill development or creating denser, less distant, communities, thereby mitigating current trends toward sprawl.

While the market could play an important role in inducing some behavioral shifts, it is unlikely to prompt a sufficiently widespread reconstitution of metropolitan space. First, given the political unpopularity of increasing fuel costs,⁹⁵ relevant government agencies might offset higher energy prices by reducing gasoline taxes, dulling the incentive effects.⁹⁶ The un-

91. Cf. Dernbach, *supra* note 2, at 10023-24 (discussing reductions in VMT that could result from increasing gasoline taxes).

92. Joelle Tessler, *With Gas Prices Soaring, Driving Drops*, S.F. CHRON., June 20, 2008, at C3.

93. Gasoline price increases in 2008 reduced gasoline consumption to a limited extent. *See id.* Nonetheless, sprawl has increased the inelasticity of gasoline consumption since many individuals do not have alternatives to extensive automobile use. *See* Vandenberg & Steinemann, *supra* note 2, at 1716 & n.198. Gasoline price increases from 2001-06 reduced consumption by only 4%, compared with the 30% reduction that occurred in response to similar increases from 1975-80. *Id.*

94. *See generally* SAFIROVA ET AL., *supra* note 42 (concluding that a high tax on VMT would have a bigger impact on reducing VMT than increasing housing density or other proposals to modify urban form).

95. In the summer of 2008, gasoline prices increased dramatically, creating a political outcry and calls for government action to lower prices. *See* Zachary Coile, *While Congress Argues, Gas Costs Keep Climbing*, S.F. CHRON., June 11, 2008, at A1 (describing increasing prices and political pressure for government action).

96. Some of the presidential candidates in 2008 responded to high gas prices in Summer 2008 by calling for reductions in gas taxes. *See* Jim Abrams, *Gas Tax Holiday Hopes Run over by Fiscal Facts*, S.F. CHRON., July 20, 2008, at A7. Political pressure to reduce gasoline taxes could, however, be countered by the highway construction interests who benefit

equal distributional impacts of increasing gasoline prices could create an additional justification for slowing price increases, since the poor generally pay a higher percentage of their income on transportation than average and would be disproportionately impacted by increasing gasoline prices.⁹⁷

Second, even if gasoline prices increased, the impact of the price increase could be offset by increasing automobile efficiency. Recently passed measures to increase fuel efficiency could reduce fuel use per mile travelled and thus lower consumer costs, dampening the price signal from increasing fuel costs.⁹⁸ If consumers' net fuel costs do not significantly change, they would have little incentive to change their housing or driving decisions. While increasing fuel efficiency is critical to reducing transportation emissions, the negative feedback loop between increasing efficiency and reducing VMT should be recognized.

Third, although increasing fuel costs might theoretically have a marginal impact on housing location decisions, other factors such as housing costs, size, quality, neighborhood amenities, and schools are likely to dominate—particularly for the middle- to upper-income residents who are most likely to live in outlying suburbs and exurbs.⁹⁹ Increasing fuel costs are more likely to induce the purchase of more efficient cars than to change housing location decisions.

Fourth, and of critical importance, even assuming that price signals create consumer demand for less sprawling development, significant legal and practical barriers currently prevent or deter developers from building infill and more compact development.¹⁰⁰ Legally, many suburban towns prohibit

from existing taxes. *See id.* (describing highway construction industry's opposition to cuts in gasoline taxes); *cf.* Dernbach, *supra* note 2, at 10017, 10023 (noting that increasing gas taxes to encourage conservation is likely to be a "political nonstarter" and observing political opposition to increasing gasoline prices).

97. For those in the lowest-income quintile, transportation costs can consume 40% of household income. *See* EWING ET AL., *supra* note 13, at 139.

98. For example, California predicted that its new GHG vehicle emission standards would, by increasing fuel efficiency, result in a net savings to consumers, dampening the price signal sent by increasing fuel prices. *See* AIR RES. BD., *supra* note 13 (describing financial impact of stricter vehicle emission standards); *cf.* Dernbach, *supra* note 2, at 10024 (observing that, without an increase in gas prices, more stringent vehicle efficiency standards could lead to increased VMT, offsetting the emission reduction gains achieved by the fuel standards).

99. In some cases, however, poorer residents are migrating to outlying suburbs in order to find larger houses at cheaper prices—they drive until they qualify for a mortgage for the kind of housing they desire. Increasing fuel costs could have a more significant impact on the locational decisions of poor and middle-class residents.

100. *See* LEVINE, *supra* note 32, at 9 ("There is a near-universal acknowledgement among transportation and land-use researchers that municipalities regularly employ their land-use regulatory powers to exclude denser development."). According to one study, the existing market for denser development is already frustrated by local zoning restrictions. *Id.* at 128.

multi-family housing, require minimum lot sizes, and require minimum floor-area ratios that lead to sprawling rather than compact development and that prevent the higher densities necessary for effective public transit.¹⁰¹ They also prohibit mixed residential and commercial uses, forcing residents to drive to shop or work.¹⁰² Suburbs engage in zoning that effectively excludes affordable housing, forcing lower-paid workers in suburban commercial centers to commute from poorer areas.¹⁰³

As a practical matter, increasing consumer demand might not be fully matched by developer supply in light of the difficulties that infill development could pose for developers. Since infill development has consequences for existing residents, infill development could require a more complex, expensive, and time-consuming environmental review process than building in undeveloped areas.¹⁰⁴ To the extent that infill development consists of affordable housing, it frequently encounters local resistance.¹⁰⁵

Fifth, higher levels of VMT reduction can be achieved only if compact and infill development lead residents to shift from cars to public transit, a shift that will occur only if efficient and convenient public transit options are available.¹⁰⁶ While market pressures for more compact housing could conceivably lead residents to advocate for increased transit through the political process, a cap-and-trade program would, at best, set in motion a long and uncertain process for achieving desirable investments in public transit.

Although a cap-and-trade program could generate price signals that might reduce VMT to some extent, the market alone is unlikely to prompt the necessary local planning and legal reforms. A proactive and coordi-

101. See *id.* at 11, 53; JOHN R. NOLON, WELL GROUNDED: USING LOCAL LAND USE AUTHORITY TO ACHIEVE SMART GROWTH 30 (2001) (describing the constraints imposed by conventional zoning).

102. See Janice C. Griffith, *Smart Governance for Smart Growth: The Need for Regional Governments*, 17 GA. ST. U. L. REV. 1019, 1023 (2001).

103. See LEVINE, *supra* note 32, at 81-85.

104. The process is not necessarily more technically difficult, since greenfield development can involve complex environmental issues. It could, however, be more politically difficult and more heavily litigated in light of existing residents' vested interests.

105. See Florence Wagman Roisman, *Sustainable Development in Suburbs and Their Cities: The Environmental and Financial Imperatives of Racial, Ethnic, and Economic Inclusion*, 3 WIDENER L. SYMP. J. 87, 99 (1998) (discussing suburban resistance to affordable housing).

106. See Badoe & Miller, *supra* note 44, at 254-59 (analyzing impact of transit demand and supply on automobile use); cf. EWING ET AL., *supra* note 13, at 113-27, 139 (arguing that the VMT-reducing potential of compact development would be enhanced by greater investment in public transportation—as well as other policy changes—and suggesting that affordable housing should be developed near transit stations).

nated policy approach to land use and transit would provide a more efficient and effective mechanism for reducing VMT.

C. The Limited Role of the Market in Increasing Building Efficiency

Unless Congress chooses to require even more rigorous federal building and appliance standards, the primary mechanism by which the federal climate change bills would affect consumer energy use would be through indirect market pressures. A properly-designed cap-and-trade program would require utilities to either reduce their emissions directly or pay to purchase additional allowances. Although the utilities are likely to achieve some of the reductions through fuel-switching to less carbon-intensive fuels (for example, by switching from coal to natural gas) and through alternative energy investments (for example, in wind and solar), these options are expensive and may require years of development.¹⁰⁷ Utilities are therefore likely to adopt energy efficiency as an important component of their emission-reduction strategies,¹⁰⁸ and to implement the strategy through consumer demand-reduction programs. In addition, national utility regulation could increase the price of electricity and natural gas, creating a direct market pressure for consumers to reduce their consumption. Each of these market-derived mechanisms for reducing demand are considered in turn below.

1. Utility Demand-Reduction Programs

A utility demand-reduction program could incorporate a wide variety of strategies.¹⁰⁹ To encourage energy efficient construction and retrofits, utilities could create incentives that range from simple rebates for energy efficient appliances¹¹⁰ to innovative financing programs that help consumers

107. See MCKINSEY REPORT, *supra* note 70, at xv (stating that efforts to develop renewable energy, add nuclear power, and modify power plants to reduce carbon “were among the most capital-intensive [GHG emission-reduction options] . . . evaluated . . . [and] tend to have the longest lead times”); *id.* at 64-65 (describing barriers to implementation of alternative power sources).

108. For example, California’s Public Utilities Commission (“CPUC”) has determined that increasing energy efficiency is the state’s most cost-effective mechanism for meeting demand. See CAL. PUB. UTIL. COMM’N, PUC’S ENERGY LEADERSHIP (2007), available at [ftp://ftp.cpuc.ca.gov/puc/070319_revenergystory0107.pdf](http://ftp.cpuc.ca.gov/puc/070319_revenergystory0107.pdf).

109. See, e.g., CPUC PLAN, *supra* note 74, at 5-6 (listing strategies utilities could use to enhance energy efficiency).

110. See *id.* For example, California’s Pacific, Gas & Electric Company, a major northern California utility, has offered rebates on compact fluorescent light bulbs and appliances. See Rebates and Energy Efficiency for Your Home, <http://www.pge.com/myhome/saveenergymoney/rebates/> (last visited Jan. 21, 2009).

overcome the capital costs associated with efficiency retrofits or alternative energy investments.¹¹¹ If authorized by state regulation, utilities could also develop rate structures that rewarded conservation by charging higher rates for higher levels of energy use.¹¹² Utilities could engage in a variety of informational and educational programs, including documenting energy use and making such information publically available, providing standards for labeling homes or products, and increasing public awareness about how and why consumers should reduce energy use.¹¹³ Such informational campaigns are essential to the success of market incentives, since consumers need to be aware of available incentives and how to take advantage of them. Informational campaigns are also crucial to inducing behavioral change: without information about the impact of their personal decisions, individuals are less likely to perceive a moral obligation to reduce energy use, an obligation that could reduce energy use independent of market incentives.

Notwithstanding the positive role that utility demand-reduction programs could play, they are unlikely to induce sufficient adoption of energy efficiency in buildings. Although emission limits will give utilities an incentive to encourage consumers to reduce energy use, some state utility rate regulations create the opposite incentive by tying utility profits to the amount of energy generated, thereby creating a disincentive to reducing energy demand.¹¹⁴ Facing an emissions cap, a utility might emphasize investments in low-carbon energy sources or carbon sequestration rather than reduce demand so as to preserve the level of energy generated. A comprehensive and effective long-term policy would incentivize both low-carbon fuel sources and demand reduction efforts.

Even if utilities do create demand-reduction incentives, like rebates or financing, the incentives must operate effectively. As discussed further be-

111. One financing mechanism under consideration is for utilities to initially finance consumers' energy efficiency or alternative energy investments. Consumers would then pay back the "loan" through the savings they realize on their monthly utility bills. See CPUC PLAN, *supra* note 74, at 16 (observing the importance of developing financing mechanisms to offset initial capital costs). The CPUC has recognized that utilities cannot fully fund energy efficiency; instead the CPUC expects utilities to "leverage and build upon financing options available from private markets and other government initiatives." *Id.*

112. See *id.* at 6 (observing generally that price and rate design can create incentives for energy efficiency and other demand-side management actions).

113. See generally *id.* at 5, 16, 27 (describing a range of education and information activities).

114. See BROWN ET AL., *supra* note 11, at 37-38, 46; MCKINSEY REPORT, *supra* note 70, at 20 (observing that "power producers' sustained earnings growth [is often] at odds with resource efficiency").

low,¹¹⁵ consumers must be aware of both the incentives and how to take advantage of them. The incentives must also be potent enough to generate the hoped-for behavior. For example, a rebate or financing that did not cover the full cost of the investment might fail to have a sufficient motivational impact.

2. Direct Market Pressures

Legislation controlling utilities could also increase the cost of energy, creating a direct market incentive for consumers to invest in energy efficiency.¹¹⁶ Given its high carbon intensity, utilities are likely to shift away from coal, the nation's cheapest and most plentiful energy source.¹¹⁷ Utilities are likely to switch to natural gas or to develop new renewable energy sources, such as wind, solar, or nuclear energy, that are currently more expensive than coal-fired power plants.¹¹⁸ As energy costs increase, owners would, in theory, have an incentive to retrofit existing buildings to make them more energy efficient, and purchasers would increase their demand for new green buildings.¹¹⁹

While higher energy costs are likely to reduce demand to some extent, market imperfections and legitimate social policy concerns will constrain the market's effectiveness.¹²⁰ First, the market might not generate a sufficient price signal to stimulate behavioral changes.¹²¹ In some states, utility regulations limit the utilities' ability to pass through higher costs, thus preventing the price signal from flowing to consumers.¹²² The political controversy associated with increasing energy prices may also make policy-

115. The impediments to unilateral consumer action are discussed more extensively below. See *infra* notes 125-39 and accompanying text.

116. See MCKINSEY REPORT, *supra* note 70, at xiii (observing that achieving GHG emission reductions will require investments in the power sector that are likely to increase electricity prices).

117. See *id.* at 12.

118. See *id.* at xv.

119. One study of metropolitan carbon footprints found a link between higher electricity prices and per capita electricity footprints. See BROWN ET AL., *supra* note 11, at 26. Although this Article does not primarily address industry, increasing energy costs could also prompt industries to become more energy efficient. However, some of the same market imperfections that could impede consumer responses could also limit industry response.

120. See MCKINSEY REPORT, *supra* note 70, at 69-70 (summarizing market imperfections that currently impede economically rational energy efficiency investments).

121. Professors Doremus and Hanemann note that the acid rain program to reduce sulfur and nitrogen oxides from utilities did not lead to energy price increases and, consequently, did not incentivize consumer conservation. See Doremus & Hanemann, *supra* note 84, at 814.

122. Robert B. McKinstry et al., *Federal Climate Change Legislation as if the States Matter*, 22 NAT. RESOURCES & ENV'T 3, 7 (2008).

makers reluctant to design programs that would increase energy prices to a level that would motivate change. As the McKinsey Report states, “motivating end users to act based on price signals alone would likely require price stimuli well beyond what may be politically feasible.”¹²³ From a social justice perspective, the regressive impacts of increasing energy costs could also lead policymakers to dampen the price impacts of carbon policies.¹²⁴ Absent measures to mitigate regressive impacts, like government-financed energy retrofits or direct compensation, policymakers may design a cap-and-trade program to limit the extent of potential price increases and, consequently, limit the extent to which prices would incentivize greater efficiency.

Even if price signals do reach consumers, they may fail to motivate reductions in consumption due to the relative inelasticity of energy demand.¹²⁵ Consumers often fail to respond to price signals due to the “split incentives” problem.¹²⁶ Those making capital investments in buildings or appliances, like builders and landlords, have an incentive to minimize initial investment costs and are therefore less likely to make energy efficiency investments, since such investments are likely to be more expensive at the outset even though they are more economically efficient in the long-run.¹²⁷

123. MCKINSEY REPORT, *supra* note 70, at 70.

124. See Marilyn A. Brown, *Market Failures and Barriers as a Basis for Clean Energy Policy*, 29 ENERGY POL’Y 1197, 1202 (2001) [hereinafter Brown, *Market Failures*] (observing that energy costs can be a significant expense for low-income families, “averaging 15% compared to 4% for the typical US citizen”).

125. See AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., *ROLE OF ENERGY EFFICIENCY IN CLIMATE POLICY 2* (2008), available at http://www.aceee.org/energy/climate/climate_paper2008.pdf (“Given the low price elasticity of the demand for energy, price increases resulting from a carbon cap will have very little effect on energy consumption.”). The McKinsey Report observes that consumers have not, historically, responded to variations in energy prices. MCKINSEY REPORT, *supra* note 70, at 70. Professor Brown notes that “[e]nergy efficiency is not a major concern for most consumers because energy costs are not high relative to the cost of many other goods and services.” Brown, *Market Failures*, *supra* note 124, at 1202. That suggests that energy price increases would have to be relatively high before they would motivate behavioral change.

126. See MARILYN A. BROWN ET AL., OAK RIDGE NAT’L LAB., *CARBON LOCK-IN: BARRIERS TO DEPLOYING CLIMATE CHANGE MITIGATION TECHNOLOGIES* 101, 102 (2007) [hereinafter BROWN ET AL., *CARBON LOCK-IN*]. Professor Brown observes that this problem has also been termed the “principal-agent” problem. See Brown, *Market Failures*, *supra* note 124, at 1199; see also MCKINSEY REPORT, *supra* note 70, at 37 (“Issues of agency and duration of ownership have historically been a major barrier to capturing energy and carbon efficiency in [the air conditioning] sector, as those who bear the initial cost of improvements are often not lifetime recipients of the benefits.”); *id.* at 41.

127. Brown, *Market Failures*, *supra* note 124, at 1199; see also MCKINSEY REPORT, *supra* note 70, at 39 (observing that builders do not bear operating costs but do pay first costs, so they have “less of an incentive to install efficient building systems”); *id.* at 40 (discussing the split incentive problem in the water heating context). Tax policies could also impact the

Purchasers and tenants, who are more likely to be concerned about life-cycle costs, do not have control over the relevant capital investments.¹²⁸ Builders and landlords have an incentive to invest in energy efficiency only to the extent that the investments create higher purchase or rental prices.¹²⁹ While there is some evidence that green measures are generating a premium,¹³⁰ uncertainty regarding future energy costs could create uncertainty about the utility of the investment.¹³¹ In addition, green features may be more likely to generate a premium for wealthier consumers and commercial entities; poorer consumers may hesitate to pay more up front, even if the investment makes long-term economic sense.¹³² Moreover, since energy costs are currently a relatively small component of most commercial entities' operating costs, it is not clear that energy efficiency features will create a significant premium in commercial markets.

Consumers may also fail to respond to price signals due to their lack of information.¹³³ Consumers currently have little access to information about the energy efficiency of either existing or new construction.¹³⁴ They may also be unaware of the extent to which retrofits could increase energy efficiency and result in long-term cost savings, be unaware of appliances' relative energy efficiency and associated cost savings, and be unaware of the steps they could take to reduce energy use.¹³⁵

preferred ratio between capital and operating costs, with preferential treatment for operating costs creating a disincentive to increasing capital costs. *See id.* at 1200.

128. *Id.*; BROWN ET AL., CARBON LOCK-IN, *supra* note 126, at 102.

129. *See* Brown, *Market Failures*, *supra* note 124, at 1200 (discussing dynamic in landlord/tenant context).

130. *See* NORM MILLER ET AL., S.D. SCH. OF BUS. ADMIN., DOES GREEN PAY OFF? (2008), available at <http://www.sandiego.edu/business/documents/USDEconofBeingGreen.pdf>.

131. *Cf.* Brown, *Market Failures*, *supra* note 124, at 1202 (observing that "uncertainty about future energy prices" can be a barrier to energy-efficient investments). Energy-efficient investments would also generate a sale or rental premium only to the extent that consumers have the sophistication to estimate the economic savings associated with efficiency. *See id.* (noting that "one of the reasons builders generally minimize first costs . . . [is that they believe] (probably correctly) that the higher cost of more efficient equipment will not be capitalized into a higher resale value" since purchasers do not understand how to do the savings calculation).

132. *See* BROWN ET AL., CARBON LOCK-IN, *supra* note 126, at 102 (observing that low-income households and small businesses might find it difficult to access credit to finance energy-efficient investments).

133. *See* MCKINSEY REPORT, *supra* note 70, at 41.

134. Brown, *Market Failures*, *supra* note 124, at 1203; *cf.* BROWN ET AL., *supra* note 11, at 51 (observing the need for federal legislation requiring greater disclosure of home energy consumption at time-of-sale).

135. *See* Brown, *Market Failures*, *supra* note 124, at 1201; Doremus & Hanemann, *supra* note 84, at 815; *see also* MCKINSEY REPORT, *supra* note 70, at 22, 37, 41; *see generally* McKinstry et al., *supra* note 122, at 7 (noting that consumers "may lack the knowledge . . .

While energy efficiency improvements are cost-effective in the long-run, consumers, particularly low-income consumers, may not have sufficient capital to make initial energy-efficiency investments in existing buildings.¹³⁶ Even if they have the means, residents or commercial entities may not remain in the building long enough to pay back their investment, and, in the event of sale, the energy-efficiency investment may not have created a sufficient, or a sufficiently certain, sales premium to justify the initial investment.¹³⁷ Studies indicate that consumers are unwilling to make investments with a payback period longer than two or three years.¹³⁸

Finally, to the extent that price signals successfully induce energy efficiency investments, the investments could result in reduced demand that, in turn, ultimately reduces energy prices, ending the incentive effect.¹³⁹ Notwithstanding the potential for initial success, market mechanisms may thus create only a temporary, rather than a long-term, incentive to reduce demand.

National market-based proposals that focus on utilities could promote utility-sponsored demand-reduction programs and directly spur green building efforts, both of which would reduce consumption to some extent. That said, the invisible hand of the market is unlikely to stimulate enough investment in energy efficiency, notwithstanding its economic rational-

to implement many demand reduction and energy-efficiency measures"); Vandenberg & Steinemann, *supra* note 2, at 1725, 1731-32 (observing that individuals have insufficient information about energy efficiency to implement climate protection norms).

136. See MCKINSEY REPORT, *supra* note 70, at 40-41; Brown, *Market Failures*, *supra* note 124, at 1202; McKinstry et al., *supra* note 122, at 7 (noting that consumers may not have "financial wherewithal" to invest in energy efficiency). Professors Vandenberg, Steinemann, and Ackerly propose programs to provide resources to poor households to enable them to invest in energy efficiency measures. See Vandenberg & Steinemann, *supra* note 2, at 1735; see generally Michael Vandenberg & Brooke A. Ackerly, *Climate Change: The Equity Problem*, 26 VA. ENVTL. L.J. 55 (2007). California's Public Utilities Commission has developed an innovative Low Income Energy Efficiency program to "provide no-cost energy efficiency and appliance testing and repair measures to qualified low income customers in rental and customer-owned residences." CPUC PLAN, *supra* note 74, at 20.

137. See CPUC PLAN, *supra* note 74, at 16 (observing that financing mechanisms need to include provisions to obtain repayment from successor owners so that the prospect of selling the property does not dissuade current owners from investing in energy efficiency improvements).

138. See MCKINSEY REPORT, *supra* note 70, at 22, 40. For example, in a study in which consumers were given a choice between two refrigerators of differing efficiencies, over half of the purchasers selected the less expensive and less efficient refrigerator, even though the more expensive and more efficient refrigerator provided an annual return on investment of around 50%. See Marilyn A. Brown, *Market Failures*, *supra* note 124, at 1198.

139. See AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., *supra* note 125, at 2 (stating that energy efficiency measures could change the "demand-supply balance," and "offset the higher energy prices resulting from a cap-and-trade system").

ity.¹⁴⁰ More direct mechanisms to spur energy-efficient buildings are necessary.¹⁴¹

III. THE LOCAL ROLE IN ADDRESSING CONSUMPTION

Local decisionmakers currently have significant control over the demand-reduction measures available in the land use, transportation, and building sectors.¹⁴² Without attempting to be comprehensive, this Part first briefly describes the types of local measures that could reduce VMT and electricity consumption.¹⁴³ It then articulates the institutional justifications for retaining a degree of local autonomy in developing such measures. Lastly, it highlights the extent to which cities have already embraced their role in addressing the fundamental causes of climate change.

A. Types of Local Initiatives to Reduce Energy Demand

Urban comprehensive plans and zoning play a critical role in establishing land use patterns that could reduce VMT.¹⁴⁴ A municipal government's

140. As the McKinsey Report states, “simply imposing ‘carbon caps’ on point-source emitters might provide the incentive—but not the means—to extract the energy efficiency potential that is distributed across millions of energy users. Policy support might consist of standards, mandates and/or incentives” See MCKINSEY REPORT, *supra* note 70, at xiv (observing that energy efficiency is the most cost-effective mechanism for reducing emissions but that “persistent barriers to market efficiency will need to be overcome”); *id.* at 40 (suggesting that, given market barriers to installing energy efficiency, “some form of policy intervention . . . may be necessary”).

141. A study comparing the impact of appliance standards versus market forces found that significant additional energy savings were achieved through the promulgation of required standards. Brown, *Market Failures*, *supra* note 124, at 1205. The CPUC, which has considered its own demand-reduction role, has concluded that “[t]here is no policy tool more essential for the widespread and persistent transformation of energy performance in California than energy codes and standards.” CPUC PLAN, *supra* note 74, at 60. As the CPUC notes, standards “make better energy performance mandatory, and not just for early adopters or self-selected consumers” *Id.*

142. *Cf.* Richard B. Stewart, *States and Cities as Actors in Global Climate Regulation: Unitary vs. Plural Architectures*, 50 ARIZ. L. REV. 681, 701 (2008) (noting that policies relating to “electricity regulation, building energy efficiency, transportation infrastructure, and land use and development patterns . . . can be better designed and implemented by [subnational actors]”).

143. Local governments could also reduce emissions through many additional measures, including facilitating or sponsoring renewable energy sources and controlling methane releases from landfills. In this Article, however, I focus on local governments’ role in reducing consumption.

144. Such planning does not, however, occur in a vacuum. It is strongly influenced by underlying tax structures and regional and state infrastructure decisions. See Norman Williams, Jr., *The Three Systems of Land Use Control*, 25 RUTGERS L. REV. 80 (1970) (describing land use controls as a function of zoning, property taxes and their role in financing local services, and infrastructure choices made by larger entities). As discussed further below,

comprehensive or general plan shapes growth patterns.¹⁴⁵ Historically, local plans and the zoning regulations that implement them have promoted sprawling growth by limiting density and separating land uses so that residents must drive for work, school, or errands.¹⁴⁶ To reverse this pattern and create the necessary preconditions for reducing VMT, municipalities could revise their general plans to adopt “smart growth” techniques that not only limit growth, but allow more compact development.¹⁴⁷ As others have elaborated in more detail, smart growth and “new urbanist” techniques include such measures as permitting increased density, allowing mixed uses, encouraging infill, and encouraging development patterns that will sustain public transportation.¹⁴⁸ In addition to direct requirements, zoning provisions could create development impact fees and permitting incentives designed to induce desired development patterns.¹⁴⁹

While land use reforms could reduce VMT somewhat by shortening driving distances, more dramatic decreases in VMT are likely to require a shift from private cars to public transportation and to non-vehicular transit. The two are related: a number of the land use changes proposed above, like increased density and mixed use development, would not only shorten driving distances, but facilitate reduced automobile usage.¹⁵⁰ Municipali-

successful land use reforms will also require addressing a number of the underlying causes of existing low-density zoning decisions. *See infra* notes 204-30 and accompanying text.

145. *See* NOLON, *supra* note 101, at 16-17.

146. *See, e.g.*, LEVINE, *supra* note 32, at 2-3; NOLON, *supra* note 101, at 30.

147. *See* LEVINE, *supra* note 32, at 82; Ziegler, *supra* note 16, at 28. Smart growth mechanisms that limit sprawl and encourage denser mixed use “livable” communities have also come under the rubric of “New Urbanism.” *See, e.g.*, EWING ET AL., *supra* note 13, at 5.

148. *See, e.g.*, EWING ET AL., *supra* note 13, at 4; J. Kevin Healy, *Local Initiatives*, in GLOBAL CLIMATE CHANGE AND U.S. LAW 426-29 (Michael B. Gerrard ed., 2007) (listing zoning and land use policies that could reduce municipal GHG emissions). The California Attorney General’s Office (“AG’s Office”) has recognized the importance of comprehensive planning to reducing future GHG emissions. Under California’s environmental review statute, the California Environmental Quality Act (“CEQA”), the AG’s Office has sued municipalities that have enacted growth-inducing general plans without considering and addressing their future greenhouse gas emission consequences. *See* Michael B. Gerrard, *Climate Change and the Environmental Impact Review Process*, 22 NAT. RESOURCES & ENV’T 20, 22 (2008). The AG’s Office provides a detailed list of direct and indirect GHG-reducing measures that municipalities can include in their general plans. *See* EDWIN G. BROWN, JR., CAL. DEP’T OF JUSTICE, THE CALIFORNIA ENVIRONMENTAL QUALITY ACT: ADDRESSING GLOBAL WARMING IMPACTS AT THE LOCAL AGENCY LEVEL 5-10 (2008), available at http://ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf.

149. *See* Healy, *supra* note 148, at 428.

150. *See id.* at 427. For example, public transportation operates best with sufficient population density to justify frequent and cost-effective service. *See* Buzbee, *supra* note 53, at 74. Mixed use developments are more likely to make trips to work or errands walkable or bicyclable.

ties alone or in combination with regional agencies can encourage a shift away from private cars by providing comfortable, convenient, reliable, and affordable public transportation alternatives.¹⁵¹ Local governments can further facilitate non-vehicular transit by making cities easily walkable and bikable.¹⁵²

Cities can also play a key role in reducing electricity consumption, although their role is somewhat less central than in the land use context.¹⁵³ More stringent federal energy efficiency standards for buildings are a distinct possibility in the future. For now, however, cities and states are likely to continue to play a key role in formulating and implementing programs to reduce building-sector energy consumption. In states that give local governments the requisite authority, local governments can draft building codes to reduce electricity and natural gas consumption.¹⁵⁴ Measures to increase energy efficiency in new buildings could include requirements relating to structural design, insulation, windows, lighting, heating, ventilation, and air conditioning systems, water heating, appliances, and siting or landscaping requirements that implicate energy use.¹⁵⁵ In some areas, water conservation through appropriate landscaping and water-saving household appliances could also reduce household carbon use.¹⁵⁶ Jurisdictions can consider direct design requirements,¹⁵⁷ certification requirements that require a certain level of efficiency, but without specifying the mechanisms by which it is to be achieved,¹⁵⁸ and incentive programs.¹⁵⁹

151. See Healy, *supra* note 148, at 425-26.

152. See EWING ET AL., *supra* note 13, at 4-5.

153. Appliance standards are generally the province of federal, and sometimes state, action. See Kaswan, *Cooperative Federalism*, *supra* note 81, at 825. The federal government has played a modest role in establishing minimum energy codes for buildings and could do more. Some states, like California, have strong state energy codes. See, e.g., Cal. Energy Comm'n, California's Energy Efficiency Standards for Residential and Nonresidential Buildings, <http://www.energy.ca.gov/title24/> (last visited Jan. 22, 2009). Even in states with strong energy codes, local governments are proposing more stringent energy codes. See Cal. Energy Comm'n, Local Ordinances Exceeding the 2005 Building Energy Efficiency Standards, http://www.energy.ca.gov/title24/2005standards/ordinances_exceeding_2005_building_standards.html (last visited Jan. 21, 2009).

154. See Healy, *supra* note 148, at 425-26.

155. See MCKINSEY REPORT, *supra* note 70, at 35-40 (describing types of energy efficiency improvements for new and existing buildings). In addition to reducing demand, green building provisions could also require or facilitate renewable energy, like site-based solar or wind power. See Sussman, *supra* note 71 at 23-35.

156. In California, the water supply system is the state's largest energy consumer. See Doremus & Hanemann, *supra* note 84, at 827.

157. See, e.g., Cal. Energy Comm'n, *supra* note 153.

158. Many jurisdictions require local construction to meet the "Leadership in Energy and Environmental Design" ("LEED") standards established by the U.S. Green Building Council. See U.S. GREEN BLDG. COUNCIL, LEED INITIATIVES IN GOVERNMENTS AND SCHOOLS

Local governments could also impose energy efficiency requirements on existing residential and commercial buildings. One mechanism is to require energy efficiency improvements at the time of sale.¹⁶⁰ Government regulations or programs could also complement and enhance market incentives for energy efficiency by increasing the quality and availability of consumer information¹⁶¹ to enhance the efficacy of existing market incentives and help consumers realize green preferences.¹⁶² Local government-sponsored financing mechanisms could help consumers address the initial capital costs of energy efficiency investments.¹⁶³

Even if state or federal governments end up playing a stronger role in establishing relevant building codes, local governments are likely to continue to play a key role in ensuring that the codes are adequately enforced. State energy codes are generally enforced at the local level by local building inspectors. Adequate local enforcement is key to effective implementation.¹⁶⁴

(2008), available at <https://www.usgbc.org/ShowFile.aspx?DocumentID=691>. Although adopting green building standards does not automatically result in energy savings, the green building requirements are likely to increase energy efficiency. Energy efficiency is one among several categories that receive points in the certification process, however, creating the possibility that a building could be certified through non-energy-related green features. The number of points accrued determines the level of LEED certification achieved, ranging from simple "Certified" to "Platinum." Jurisdictions differ significantly in the stringency of the certification they require or reward.

159. Local government incentive programs include policies like permit fee reductions, expedited permitting, and property tax adjustments. See YUDELSON ASSOCS., NAT'L ASS'N OF INDUS. & OFFICE PROP., GREEN BUILDING INCENTIVES THAT WORK: A LOOK AT HOW LOCAL GOVERNMENTS ARE INCENTIVIZING GREEN DEVELOPMENT (2007), available at <http://www.naiop.org/foundation/greenincentives.pdf>.

160. See CPUC PLAN, *supra* note 74, at 16, 84.

161. See *id.* at 32 (discussing government programs to benchmark commercial buildings and require disclosure of energy information as well as potential local government programs to condition the renewal of building occupancy certificates on minimum energy benchmarks).

162. See *supra* notes 133-35 and accompanying text (discussing the role of information in enhancing market incentives and inducing behavioral change).

163. See, e.g., CPUC PLAN, *supra* note 74, at 32 (discussing importance of financing to encouraging investments in energy efficiency in existing buildings). In 2008, California adopted legislation that would give cities the authority to provide local citizens with loans for energy efficiency and renewable energy and allow them to repay the loan over time through their property taxes. See Margot Roosevelt, *Green Energy Financing OK'd*, L.A. TIMES, July 23, 2008, at B3.

164. Cf. CPUC PLAN, *supra* note 74, at 16 (observing the importance of effective enforcement of energy codes); *id.* at 61, 82 (observing that the state's energy code is enforced by local governments); *id.* at 85 (noting that local enforcement appears to be weak).

B. Institutional Justifications for Local Control

There are strong institutional justifications for retaining a local or regional role in reducing consumption. First, much of the consumption that lies behind GHG emissions, like driving behavior and buildings' energy use, takes place in cities.¹⁶⁵ While that does not preclude other levels of government from taking regulatory action, municipalities are in a strong position to address the causes of climate change.

Furthermore, the sources of GHG emissions and the opportunities for GHG emission reductions vary considerably across the nation.¹⁶⁶ Local governments are well positioned to determine the most significant sources of demand within their jurisdiction and tailor strategies accordingly.¹⁶⁷ For example, cities that rely on carbon-intensive energy sources, like coal-fired power, might devote particular attention to increasing energy efficiency and encouraging local renewable energy in comparison with cities, like Seattle, that use less carbon-intensive sources of electricity.¹⁶⁸ Weather patterns might also determine priorities; cities in both hot and cold climates might focus more on energy efficiency measures than cities in more temperate climates. The most suitable strategies could also depend upon whether the area anticipates growth. Changing land use policies to reduce sprawl and creating new building standards are particularly important in growing areas,¹⁶⁹ while strategies to address existing buildings are likely to predominate in areas where population is stagnant. The nature of a re-

165. As Professor Robert Verchick has stated: “[Cities] are where the pollution is” Robert R.M. Verchick, *Why the Global Environment Needs Local Government: Lessons from the Johannesburg Summit*, 35 URB. LAW. 471, 475 (2003).

166. See MCKINSEY REPORT, *supra* note 70, at 22, 67-68. The McKinsey Report observes that GHG abatement strategies have significantly differing costs in different regions reflecting “regional differences in population growth and/or density, carbon intensity of local power general portfolios, energy productivity, climate, availability of renewable energy sources, forest cover, agricultural orientation, concentration of industrial activity, and other factors.” *Id.* at 22.

167. See Richard Briffault, *The Local Government Boundary Problem in Metropolitan Areas*, 48 STAN. L. REV. 1115, 1124 (1996) (observing that local governments can provide goods and services efficiently given their capacity “to match distinctive local conditions and preferences”); Buzbee, *supra* note 53, at 94 (arguing that local governments have land use authority because their local knowledge gives them the requisite institutional competence); Hari M. Osofsky, *Climate Legislation in Context*, 102 NW. U. L. REV. 245, 247-48 (2008) [hereinafter Osofsky, *Climate Change*].

168. See GLAESER & KAHN, *supra* note 28, at 5 (noting differences in carbon intensity of regionally-common fuel sources); see also JOHN BAILEY, LESSONS FROM THE PIONEERS: TACKLING GLOBAL WARMING AT THE LOCAL LEVEL 3, 9 (2007), available at <http://www.newrules.org/de/pioneers.pdf> (observing that different fuel sources have a significant impact on cities' carbon footprints).

169. See EWING ET AL., *supra* note 13, at 78 (observing that high growth areas are more likely to reduce VMT through smart growth land use measures).

gion's economic base could also influence appropriate strategies. Mixed uses may be an appropriate land use strategy for non-polluting industries and employers, but impose unacceptable public health risks in areas that rely on heavier industry.

Many classic arguments in favor of local control resonate in democratic theory. Given the local consequences of land use and building policies and their importance in shaping metropolitan space, federalism advocates would argue that local governments should be given the power to express the preferences of local citizens, preferences that could be diluted and harder to discern in larger fora.¹⁷⁰ Moreover, some argue that citizens can more easily and effectively participate in local governmental decisions than in state or national venues.¹⁷¹

Local governments can also serve as classic "laboratories of invention." The local climate change and smart growth initiatives blossoming around the country will provide insights into the strength and weaknesses of a variety of strategies.¹⁷² Rather than locking into one, potentially flawed, model, the entire nation could benefit from a diversity of approaches.

C. The Local Commitment

Local action is not only practically important and institutionally justified, but well underway. Local governments are recognizing their important role in climate change policy. As of January 25, 2009, 910 mayors have signed the U.S. Conference of Mayors' Climate Protection Agreement (the "Agreement"),¹⁷³ drafted in 2005 in response to the United States' continued rejection of the Kyoto Protocol. The Agreement commits its signatories to strive to "meet or beat" the Kyoto Protocol's climate change objective for the United States of 7% below 1990 emissions by 2012,¹⁷⁴ an

170. See Briffault, *supra* note 167, at 1123-24; Buzbee, *supra* note 53, at 92.

171. See Briffault, *supra* note 167, at 1123-24; Verchick, *supra* note 165, at 475-77.

172. See Kirsten H. Engel, *Harnessing the Benefits of Dynamic Federalism in Environmental Law*, 56 EMORY L.J. 159, 182-83 (2006); Stewart, *supra* note 142, at 700-01.

173. See Map of Participating Mayors, Mayors' Climate Protection Center, <http://www.usmayors.org/climateprotection/map.asp> (last visited Jan. 25, 2009). Over 172 U.S. municipalities have joined the "Cities for Climate Protection Campaign" of the International Council for Local Environmental Initiatives ("ICLEI"), which provides resources for municipalities who follow a prescribed process for setting greenhouse gas emission reduction goals.

174. See U.S. CONFERENCE OF MAYORS, U.S. MAYORS CLIMATE PROTECTION AGREEMENT (2005), available at <http://www.usmayors.org/climateprotection/documents/mcpAgreement.pdf>.

ambitious target in light of the almost 15% increase in U.S. emissions between 1990 and 2006.¹⁷⁵

Land use, transportation, and buildings policies figure prominently among the strategies identified within the agreement for meeting local emissions targets.¹⁷⁶ Participating mayors have agreed to adopt anti-sprawl land use policies and to promote bicycles, public transit, and programs to reduce commuting.¹⁷⁷ They also commit to making energy efficiency a “priority” by updating building codes and promoting sustainable building practices generally, and by improving energy efficiency within municipal buildings more specifically.¹⁷⁸

Of course, signing the agreement does not guarantee its effective implementation. A January 2007 assessment of ten cities whose mayors had signed the Agreement and are known as environmentally active indicated that all of the cities had recently increased, rather than decreased, their GHG emissions and were highly unlikely to meet their reduction goals.¹⁷⁹ Population increases contributed to the emissions growth in some instances, but in others GHG emissions outpaced population growth, revealing an increase in per capita emissions.¹⁸⁰ As of early 2007, cities were hoping that changes in state or federal policy, like increasing renewable energy and increasing vehicle fuel economy, would achieve most of the reductions,¹⁸¹ and had undertaken only a few discrete one-time actions at the local level.¹⁸² Municipal strategies to comply with the Agreement have no doubt evolved since the January 2007 report. The report nonetheless reveals the risk of a gap between political rhetoric and concrete implementation.

175. See U.S. ENVTL. PROT. AGENCY, *supra* note 69, at ES-4.

176. In addition to land use and buildings, other emission reduction strategies the Agreement suggests include promoting alternative energy, minimizing emissions from waste disposal, reducing emissions from local vehicle fleets, increasing water use efficiency and recycling, promoting urban forests as sinks and for shade, and public education functions. U.S. CONFERENCE OF MAYORS, *supra* note 174.

177. *Id.* at 1 (advocating “[a]dopt[ing] and enforce[ing] land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities” and “[p]romot[ing] transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit”).

178. *Id.*

179. BAILEY, *supra* note 168, at 10-12.

180. *Id.* Of the ten cities examined, the only ones to reduce their per capita GHG emissions were Austin, Texas, and Portland, Oregon. *Id.* at 12.

181. *Id.* at 13.

182. *Id.* at 13-14. For example, many of the cities reduced municipal emissions through capturing methane from landfills. *Id.* at 14.

Several examples reveal the potential inherent in local action to reduce demand. Portland, Oregon has already seen the fruits of its earlier land use and transit policies. Portland's sustainable development initiatives began in the 1970s, when Portland adopted urban growth boundaries to stem sprawl and established the nation's first local energy policy.¹⁸³ To implement the carbon dioxide reduction plan it adopted in 1993, the city developed two new light rail lines and increased public transit use by 75% from 1990 levels.¹⁸⁴ The city has also overseen the construction of green buildings and weatherized 10,000 multi-family units as well as 800 homes.¹⁸⁵ Although Portland has failed to reduce its overall emissions and failed to meet its carbon dioxide reduction goals due to population growth, the city's multiple GHG reduction initiatives have reduced per capita emissions by 12.5% since the early 1990s.¹⁸⁶ Arguably, reductions in per capita emissions are more significant than reductions in net emissions, since the new Portland residents are likely emitting at a lower per capita rate than they would have emitted in another location.

The Sacramento, California region has engaged in an ambitious regional planning effort to counter projected increases in congestion and pollution. In 2004, a regional agency representing the six counties comprising the greater Sacramento, California metropolitan area adopted a "Preferred Blueprint Scenario for 2050" that outlined regional growth principles and identified regional growth parameters that local governments can, on a voluntary basis, implement.¹⁸⁷ The relevant growth principles include using existing assets through infill development, compact development, mixed use development, and providing alternative transportation alternatives.¹⁸⁸ The regional agency predicts that, by 2050, the Blueprint will lead to an

183. See Hari M. Osofsky & Janet Koven Levit, *The Scale of Networks?: Local Climate Change Coalitions*, 8 CHI. J. INT'L L. 409, 415-16 (2008) [hereinafter Osofsky & Levit, *The Scale of Networks*].

184. *Id.* at 417. Seattle has also developed a regional transit plan to reduce driving and increase public transportation. Healy, *supra* note 148, at 425.

185. Osofsky & Levit, *The Scale of Networks*, *supra* note 183, at 417.

186. *Id.* Portland's success is attributable not only to its land use and transportation initiatives, but also to investments in energy efficiency, solid waste and recycling, urban forestry, and renewable energy. *Id.* at 416.

187. See SACRAMENTO AREA COUNCIL OF GOV'TS & VALLEY VISION, PREFERRED BLUEPRINT ALTERNATIVE (2007) [hereinafter PREFERRED BLUEPRINT ALTERNATIVE], available at http://www.sacregionblueprint.org/sacregionblueprint/the_project/BP_Insert_JAN_2005.pdf; Ana Campoy, *With Gas Over \$4, Cities Explore Whether It's Smart to Be Dense*, WALL ST. J., July 1, 2008, at A1. Although voluntary, many of the local governments are implementing the blueprint's agenda. See Sacramento Blueprint, Local Government Features, http://www.sacregionblueprint.org/sacregionblueprint/the_project/localGovtFeatures.cfm (last visited Jan. 21, 2009).

188. PREFERRED BLUEPRINT ALTERNATIVE, *supra* note 187.

average household VMT of 34.9 miles per day instead of the 47.2 miles per day predicted based on current development trends.¹⁸⁹ Carbon dioxide emissions in 2050 are projected to be 14% lower than the business-as-usual estimate.¹⁹⁰ In conjunction with the regional Blueprint, the regional agency proposed a draft municipal transportation plan in March 2008 that is designed to complement the smart growth initiatives outlined in the Blueprint and facilitate driving reductions and alternatives.¹⁹¹

Elsewhere, individual development projects are increasingly combining uses and becoming denser.¹⁹² Rejecting the pattern of sprawling single-family home development, the California cities of San Mateo and San Jose have recently unveiled plans for new mixed use developments providing a variety of housing options.¹⁹³

On the green building front, according to the U.S. Green Building Council, 152 localities around the country are moving beyond federal and state minimum requirements to adopt their own green building requirements for municipal and, in some cases, private, construction—requirements that could lead to more energy-efficient buildings.¹⁹⁴ Many of these efforts have been initiated within the last year.

The commitment and initiative being taken at the local level is inspiring and justified. Local action will be critical to achieving deep GHG emission reductions. The fundamental question is: can we rely on individual localities to take the necessary initiative, or do we need broader state and federal structures through which to stimulate and shape local actions? The next section addresses this question.

189. *Id.* at 9.

190. *Id.*

191. See SACRAMENTO AREA COUNCIL OF GOV'TS, METROPOLITAN TRANSPORTATION PLAN FOR 2035 (2008) [hereinafter METROPOLITAN TRANSPORTATION PLAN], available at <http://sacog.org/mtp/2035/final-mtp>.

192. See EWING ET AL., *supra* note 13, at 27 (describing a 2003 listing showing 647 “new urbanist” developments).

193. See John King, *Smart Growth at the San Mateo Racetrack*, S.F. CHRON., Aug. 17, 2008, at B1; James Temple, *San Jose Leaders Try to Reverse Urban Sprawl*, S.F. CHRON., Aug. 17, 2008, at B1.

194. U.S. GREEN BLDG. COUNCIL, *supra* note 158. Although adopting green building standards does not automatically result in energy savings, the green building requirements are likely to increase energy efficiency. Many of the local requirements or incentives are tied to the LEED certification requirements created and implemented by the U.S. Green Building Council. *Id.* Energy efficiency is only one among several categories that receive points in the certification process, creating the possibility that a building could be certified through non-energy-related green features.

IV. IMPEDIMENTS TO LOCAL ACTION

Notwithstanding the importance of existing local actions and the centrality of local governments to achieving climate change goals, local governments are unlikely to undertake sufficient efforts solely on their own initiative. Disincentives to collective action, political, social, and economic forces, and federal and state laws are all likely to impede sufficient local action. Ultimately, federal and state laws will need to establish cooperative federalist structures that require the necessary local action while simultaneously maximizing the benefits of local autonomy.

A. Collective Action Impediments to Local Initiatives

With a transboundary international legal problem like climate change, collective action problems are likely to create disincentives for the necessary level of local initiatives. Addressing climate change could create a fundamental disparity in the distribution of costs and benefits. Climate change measures could impose costs on local governments by impairing their ability to attract desired or exclude undesired development.¹⁹⁵ Meanwhile, climate change benefits accruing from local action are incremental, remote, and widely distributed. A community that incurs local economic costs by adopting land use changes or more stringent building standards will not reap corresponding climate change benefits.¹⁹⁶

That said, the cost/benefit calculus in the climate change context is complicated. First, although a given community cannot protect itself from the environmental consequences of climate change by reducing its emissions, it may act in the hope that it will inspire similar action in other localities and that the cumulative impact of local reductions will be environmentally significant.¹⁹⁷

Second, local government actions could lead to non-climate benefits that compensate for local costs. Local political leaders may perceive personal political benefits to setting popular climate change goals. If political capital is the primary benefit, however, then local regulation may not go far, since concrete implementation steps could be more politically controver-

195. See generally GLAESER & KAHN, *supra* note 28, at 11 (observing that environmentally-friendly measures are likely to deter development).

196. See SAFIROVA ET AL., *supra* note 42, at 31 (observing that urban areas will not reap climate change benefits from land use changes and that policies to reduce energy consumption should therefore “be national, not local”); Kirsten H. Engel & Barak Y. Orbach, *Micro-Motives and State and Local Climate Change Initiatives*, 2 HARV. J.L. & PUB. POL’Y 119, 119 (2008).

197. See Engel & Orbach, *supra* note 196, at 129.

sial. As noted above, cities risk a gap between rhetoric and implementation.

Conceivably, however, smart growth and building requirements could generate substantive short-term non-climate co-benefits that would outweigh their costs, like healthier and more livable cities, preservation of open space, and cheaper infrastructure and energy costs.¹⁹⁸ But smart growth and green building measures have not revolutionized the built environment to date, raising questions as to whether cities truly value their benefits more than their perceived costs. Unless cities are convinced of associated non-climate-related co-benefits, the imbalance in costs and benefits renders sufficiently widespread and vigorous local action unlikely.¹⁹⁹

Moreover, the leakage concerns that have haunted state legislatures arise in the local context as well and may disincentivize local action.²⁰⁰ Municipalities considering zoning or green building limitations face the risk that such limitations would drive housing or commercial developers to locations that do not impose constraints.²⁰¹ If limitations in fact drive development elsewhere, then a municipality that adopted local climate change regulations would have incurred the loss of desired development to no end, since the development, and its problematic emissions, simply went elsewhere. The fear of leakage thus creates a disincentive for local action.

Local entities might also hope to “free ride” on other localities’ efforts.²⁰² Given the global benefits of climate change reduction efforts, individual cities might hope to benefit from other cities’ initiative without making any (perceived) sacrifices themselves.

Cities have already taken a surprising level of initiative in light of these collective action challenges. Nonetheless, the collective action challenges suggest why seemingly enthusiastic cities may fail to follow through on their political rhetoric, and why some cities may not jump on the band-

198. See EWING ET AL., *supra* note 13, at 27-31; Stewart, *supra* note 142, at 691-92 (noting the “collateral local benefits” that cities might experience if they adopt transportation, land use, and building measures to address climate change).

199. See Stewart, *supra* note 142, at 701 (“Local jurisdictions will presumably not undertake independent climate regulation unless they expect that the economic and environmental benefits will outweigh the costs, including leakage costs”).

200. See Kaswan, *Cooperative Federalism*, *supra* note 81, at 795 (discussing how leakage concerns are likely to chill unilateral state action to address climate change).

201. See GLAESER & KAHN, *supra* note 28, at 11 (suggesting that environmental land use measures deter development and shift it to areas with less environmental regulation); Ziegler, *supra* note 16, at 59 n.127 (observing that cities that attempt to control sprawl risk losing their tax base to surrounding towns).

202. See Engel & Orbach, *supra* note 196, at 120, 129 (suggesting that free riding would be a rational response where actors cannot reap the direct benefits of their regulatory actions).

wagon at all. Collective action problems are not, moreover, the only impediment to local initiatives, particularly when they implicate politically and socially sensitive land use parameters.

B. Political, Economic, and Social Disincentives to Local Action

On a fundamental level, inertia is a powerful force. Residents, city planners, and developers may be reluctant to envision alternative models. Individuals, comfortable with their existing lifestyles, could find change unappealing or threatening.²⁰³

Local governments, properly serving their democratic function, also focus on local rather than regional—much less global—interests. This parochialism creates a powerful force against land use or other local changes. “Fiscal zoning” designed to maximize municipal revenue and minimize costs has driven (and is likely to continue to drive) purely local land use decisions.²⁰⁴ Communities compete for continued residential or business expansion.²⁰⁵ Suburban communities have engaged in low-density zoning to keep property values high and exclude affordable housing that could lead to higher public service costs.²⁰⁶ As a political matter, existing residents who consciously chose a spacious suburban environment are likely to resist proposals for infill or for more compact development.²⁰⁷ Even communities that have adopted “smart growth” measures have sometimes served parochial rather than regional interests. As Professor Edward Ziegler has observed, land use measures with a “smart growth” patina have set growth boundaries to preserve open space for the benefit of local residents, but

203. See Griffith, *supra* note 102, at 1025; see also DEBORAH SALON & DANIEL SPERLING, CITY CARBON BUDGETS: A POLICY MECHANISM TO REDUCE VEHICLE TRAVEL AND GREENHOUSE GAS EMISSIONS 9-10 (2008), available at http://pubs.its.ucdavis.edu/publication_detail.php?id=1178 (observing that a significant challenge to developing local strategies to reduce VMT will be citizens’ willingness to accept lifestyle changes); Ziegler, *supra* note 16, at 61 & n.138 (noting that regional efforts to achieve effective smart growth will be difficult in light of voters’ fear of the unknown).

204. See Briffault, *supra* note 167, at 1134; Williams, *supra* note 144, at 82-85 (describing how tax policies create exclusionary zoning incentives).

205. See Buzbee, *supra* note 53, at 95.

206. Briffault, *supra* note 167, at 1134; see also BROWN ET AL., *supra* note 11, at 35; Ziegler, *supra* note 16, at 58.

207. See Griffith, *supra* note 102, at 1024; Peter W. Salsich, *Toward a Policy of Heterogeneity: Overcoming A Long History of Socioeconomic Segregation in Housing*, 42 WAKE FOREST L. REV. 459, 497-98 (2007) (describing suburban opposition to development proposals that would increase density).

have not increased density, thereby pushing new development even further out and increasing sprawl to the detriment of the region.²⁰⁸

Nor do local governments function as perfect democracies. While local governments have the potential to provide a broader participatory forum than their state or federal counterparts, local governments are subject to power politics. For example, influential developers and builders are likely to oppose constraints, like stricter building codes or affordable housing requirements, that they fear will impair their autonomy and profitability. Real estate companies could resist energy efficiency requirements at the point of sale due to concerns about their impact on property transactions. These interested parties deserve a voice in local government deliberations. However, in comparison with the diffuse public interest in addressing climate change, the developers could end up having a disproportionate role in decisionmaking.²⁰⁹ Ironically, contrary to the image of local democracies as more receptive to citizen input, citizens may have more difficulty organizing their diffuse environmental interests into effective lobbying at the local level than at the state or national level.²¹⁰

While local municipalities represent the democratic will of their constituents, they do not, by definition, respond to the needs of those affected by but excluded from the communities' decisions.²¹¹ In particular, although many communities rely on workers who cannot find affordable housing within the community, these workers do not have any influence on the community's exclusionary zoning practices. Moreover, if regional or state-level decision-makers determine that municipalities should not prevent dense development, then that determination also represents the democratic will, a will expressed on a larger and more representative scale.²¹²

More fundamentally, local governments, both urban and suburban, may face political obstacles to adopting infill land use strategies that would integrate both cities and suburbs.²¹³ As Professor Florence Wagman Roisman has stated bluntly: cities and suburbs "have separate governments in

208. Ziegler, *supra* note 16, at 57, 58, 62.

209. See Buzbee, *supra* note 53, at 80-84 (describing the disproportionate role of transportation and real estate industries relative to diffuse citizen interests).

210. See *id.* at 90.

211. See LEVINE, *supra* note 32, at 42; Briffault, *supra* note 167, at 1132-33; see also *id.* at 70 (noting that those excluded from communities will be unable to have a voice in their zoning regulations).

212. See LEVINE, *supra* note 32, at 42 ("Notwithstanding an ostensible American predilection for participatory local governance, any geographic aggregation in a democratic system includes some dimension of the people's will and excludes others.").

213. Cf. *id.* at 82 (noting the "tough[] political fight [that] awaits those who attempt to redress the NIMBYism and regulatory opposition that now face most infill projects").

large part because of a desire to have white and non-poor people live apart from those who are poor and non-white.”²¹⁴ She cautions that these racial and economic divisions “cannot be cured without reducing or eliminating the desire for separation and the policies that promote the separation.”²¹⁵ As long as racial bias continues, middle and upper-income individuals may be reluctant to move back to the cities or inner suburbs. Similarly, suburbs may be unwilling to adopt zoning revisions that permit affordable housing for lower-paid suburban workers seeking housing closer to their jobs.²¹⁶

Middle and upper-class resistance to returning to the urban core is also a reaction to the low quality of urban municipal services. Urban cores, as well as some inner-suburbs, typically have poorer schools (both financially and in terms of performance), deteriorating infrastructure, less open space, and concerns about public safety.²¹⁷ In light of the deterioration of services within poor urban centers, there may be little market for upscale housing within denser urban boundaries,²¹⁸ and little reason for local or regional governments to expect infill land use policies to succeed.²¹⁹

Infill policies also face resistance from residents within the urban center. Remembering the legacy of earlier urban renewal efforts that ousted poor residents for the benefit of middle and upper-income residents, existing inner-city residents fear that infill developments could lead to gentrification that displaces poor residents who have few options due to shortages of affordable housing and the persistence of housing discrimination.²²⁰ Poor residents in urban cores could also resent efforts to promote housing for al-

214. Roisman, *supra* note 105, at 110; *see also* Buzbee, *supra* note 53, at 64-65 (observing that increasing suburbanization partly resulted from “white flight” from urban centers).

215. Roisman, *supra* note 105, at 111.

216. *Cf.* Salsich, *supra* note 207, at 473 (citing Professor William Fischel’s observation that “local zoning has a systematic bias toward low-density residential uses in part because of a desire to keep new housing for low-income households out of the community.”).

217. *See* Roisman, *supra* note 105, at 102 (describing white perceptions of urban centers); Ziegler, *supra* note 16, at 34; *cf.* Buzbee, *supra* note 53, at 67-70 (suggesting that residents have left central cities due to concerns regarding infrastructure, education, and crime and discussing sprawl’s impact on central cities).

218. *See* Ziegler, *supra* note 16, at 43.

219. There has been some “back-to-the-city” movement in recent years, but the levels remain quite modest. *See* Roisman, *supra* note 105, at 113.

220. *See* John A. Powell, *Race, Poverty, and Urban Sprawl: Access to Opportunities through Regional Strategies*, in *GROWING SMARTER: ACHIEVING LIVABLE COMMUNITIES, ENVIRONMENTAL JUSTICE, AND REGIONAL EQUITY* 51, 61, 65 (Robert D. Bullard, ed., 2007). Inner-city residents may fear that the city of the future concentrates the wealthy in the newly-desirable inner-city, and relegates the poor to fringe suburbs where they are isolated by high transportation costs. Professor Powell has noted that, in richer cities with few low-income census tracts, new development does appear to have displaced the poor into more remote suburbs. *See id.*

ready-privileged middle and upper-income residents.²²¹ Finally, changing the racial and income structure of a city could dilute the power and cultural identity established by the city's existing residents.²²²

In this uncomfortable political, economic, and social reality, local governments may well resist calls for zoning reform. Parochial economic interests, the realities of power politics, and enduring racial tensions could all undermine the prospects of what appear to be rational VMT-reducing land use reforms.

C. Federal and State Obstacles to Local Action

Federal and state policies have also created incentives for sprawl and high VMT that, on their flip side, create disincentives for smart growth. As noted above, state tax structures that require local governments to finance local services have created a strong incentive for suburban governments to engage in fiscal zoning that encourages development that will generate high tax revenue but require few services.²²³ As a consequence, many suburbs court tax-generating commercial development but preclude affordable housing, since low-cost housing generates relatively little in tax revenue but leads to infrastructure costs like public schools. With little affordable housing in the new suburban business centers, lower-paid workers face long commutes.²²⁴

State and federal infrastructure financing also has a significant impact on land use decisions.²²⁵ Professor Marilyn Brown observes that states receive highway funding from the Federal Highway Administration based, in part, upon the taxes they contribute to the Highway Trust Fund, which is, in turn, based upon each state's vehicle use.²²⁶ Since efforts to cut vehicle use would reduce transportation funding, the financing system creates a disincentive for state transportation officials to design a transportation infrastructure that would reduce vehicle use. More generally, state and federal transportation financing decisions have a significant impact on sprawl,

221. *See id.* at 65. Powell responds to this concern by observing that, to address affordable housing needs, poor urban centers require the resources associated with mixed-income housing. *Id.* at 66. Support for higher-income housing is, in this analysis, necessary to improve the well-being of the poor.

222. *Cf. id.* at 60 (explaining why inner-city communities have resisted regional government).

223. *See Williams, supra* note 144, at 82-85.

224. *See EWING ET AL., supra* note 13, at 141 (describing impact of local tax policy on affordable housing with consequent impacts on commute distances).

225. *See Williams, supra* note 144, at 84-87 (describing how highway decisions impact future growth patterns).

226. *See BROWN ET AL., supra* note 11, at 34-35.

since the creation of new highways can attract and enable sprawling growth.²²⁷ Federal transportation bills also continue to provide significantly more funding for highways than for public transportation.²²⁸ Although some federal transportation and environmental programs have attempted to encourage greater coordination between transportation financing, VMT, and land use planning, they have not fundamentally reformed the role of transportation infrastructure financing in increasing sprawl.²²⁹

Federal tax policies have also indirectly impacted suburban sprawl and consumption. Since federal bank guarantees and the federal mortgage deduction lower the effective cost of housing purchases, they have made larger homes more affordable and generated more demand for large suburban single-family homes.²³⁰

Although cities have a central role to play in reducing demand and its associated emissions, and although many cities have initiated their own climate change initiatives, existing obstacles to local action will prevent many cities from realizing their full potential to reduce consumer demand.

227. See Bartholomew, *supra* note 48, at 165-70.

228. See BROWN ET AL., *supra* note 11, at 35. The federal government provides up to 80% of the cost of new highways, and 90% of the cost for improvements and maintenance. *Id.* Federal transit money, in contrast, is provided through a time-consuming competitive process and, if provided, generally provides no more than 60% of the cost. *Id.* Local governments must often provide the remaining 40% or more for public transportation projects. *Id.*

229. For example, recent federal transportation legislation, beginning with the Intermodal Surface Transportation Efficiency Act of 1991 ("ISTEA"), has encouraged regional transportation planning organizations to consider land use implications, modes of transit in addition to cars, and the environmental implications of highway infrastructure. See Bartholomew, *supra* note 48. In addition, the federal Clean Air Act requires that transportation plans and projects in areas that have not attained air quality standards must "conform" to the attainment plan established in the region and cannot lead to increases in VMT that would worsen air quality. See Arnold W. Reitze, *Air Quality Protection Using State Implementation Plans - Thirty-Seven Years of Increasing Complexity*, 15 VILL. ENVTL. L.J. 209, 292-97 (2004) (describing the Clean Air Act's evolving conformity provisions). In this volume, Professor Bartholomew describes how these programs have failed to provide a sufficient brake on sprawl-inducing transportation investments and their limits as mechanisms for reforming local land use planning on a broad scale. See Bartholomew, *supra* note 48, at 191-205 (describing transportation legislation's limits, describing the Clean Air Act's conformity analysis limitations, and summing up existing laws' insufficiency).

230. See BROWN ET AL., *supra* note 11, at 37; John C. Dernbach & Scott Bernstein, *Pursuing Sustainable Communities: Looking Back, Looking Forward*, 35 URB. LAW. 496, 505 (2003); Ziegler, *supra* note 16, at 36 (noting the role of mortgage guarantees and deductions in promoting new home purchases and enabling sprawl).

V. VERTICAL INTEGRATION: LOCAL ACTION IN A FEDERAL, STATE, AND REGIONAL CONTEXT

The obstacles described above suggest that federal or state requirements will be necessary to promote local action. Ultimately, as a growing number of scholars have recognized, effective federal climate change policy must consider and integrate initiatives at the federal, state, regional, and local level.²³¹ At the same time, the advantages of local control argue for providing local governments with a significant (though not unbounded) degree of autonomy in implementing federal or state requirements.

The land use and transportation context presents a particularly difficult federalism challenge. Federal or state mandates will be essential to overcome local parochialism,²³² but a local or regional role is simultaneously essential on both a practical and political level. In the buildings context, the federalism issues remain important, but are somewhat less delicate. Minimum federal standards for residential and commercial buildings are more feasible than federally dictated land use requirements since they are less sensitive to local community values and needs. They could also provide an advantage to national developers by reducing the multiplicity of standards that currently prevail. While the discussion below does not explicitly differentiate between the land use and buildings context, specific provisions in federal legislation may well treat the two areas differently.

A. Federal Legislation and State Implementation Planning

As this Article and others have proposed, federal climate change legislation should include a variant on the state implementation plan process currently included in the existing federal Clean Air Act.²³³ Under this verti-

231. See Doremus & Hanemann, *supra* note 84; Kaswan, *Cooperative Federalism*, *supra* note 81; Osofsky, *Climate Legislation in Context*, *supra* note 167, at 247 (“Climate change is a multiscalar problem that demands multiscalar solutions.”); Osofsky & Levit, *The Scale of Networks*, *supra* note 183; Thomas D. Peterson et al., *Developing a Comprehensive Approach to Climate Change Policy in the United States that Fully Integrates Levels of Government and Economic Sectors*, 26 VA. ENVTL. L.J. 227 (2008); Stewart, *supra* note 142, at 701 (noting that generic national measures “must be carefully linked with functionally related local regulatory programs . . . and institutional arrangements”); see also Buzbee, *supra* note 53, at 103-07 (suggesting that a vertically integrated approach involving federal, state, and local governments is necessary to address sprawl); Dernbach & Bernstein, *supra* note 230, at 509 (observing that sustainable communities cannot be achieved by local action alone, but require supportive state and federal policies).

232. See Shelby D. Green, *The Search for a National Land Use Policy: For the Cities’ Sake*, 26 FORDHAM URB. L.J. 69, 72 (1998) (noting that some scholars advocate a national land use policy to overcome local decisions that fail to consider regional impacts).

233. Doremus & Hanemann, *supra* note 84; Kaswan, *Cooperative Federalism*, *supra* note 81; Peterson et al., *supra* note 231, at 264. Other federal laws impose state planning re-

cally-integrated approach, federal legislation would establish federal requirements, parameters, and oversight while decentralizing those implementation decisions that are best executed at a state or local level.²³⁴ As a first step, the legislation would require the EPA to identify the GHG emissions reductions to be achieved at the state or local level and then allocate responsibility for achieving those reductions among the states.²³⁵ For ex-

quirements and could provide a model for climate change legislation. For example, the Coastal Zone Management Act supports state land use planning and gives states a variety of options for engaging in such planning or delegating planning responsibilities to more local jurisdictions. See Green, *supra* note 232, at 107-08 (describing statute's planning approach).

234. Peterson et al., *supra* note 231, at 264. Since the federal government does not have the constitutional authority to impose direct duties upon states and other subnational entities, see *New York v. United States*, 505 U.S. 144 (1992), federal legislation that imposed responsibilities on state and local governments would have to be carefully designed to avoid constitutional limitations. As in the Clean Air Act, the federal government could condition federal funding, like transportation funds, on performance of the legislation's requirements, or give states the option of having the federal government perform the required planning and regulation instead. See Buzbee, *supra* note 53, at 100-02 (discussing the impact of constitutional constraints on potential federal efforts to address sprawl); *id.* at 107-24 (describing the possible use of conditional federal funding to control sprawl).

In the early 1970s, Congress considered but failed to adopt a federal land use law that would have required states to engage in land use planning on their own or in cooperation with local governments. See Green, *supra* note 232, at 117-18. The legislation recognized the broad impact of local decisions and was intended to ensure that local governments did not undermine regional well-being. *Id.*

235. See Doremus & Hanemann, *supra* note 84, at 823; Kaswan, *Cooperative Federalism*, *supra* note 81, at 836; McKinstry et al., *supra* note 122, at 7-8; Peterson et al., *supra* note 231, at 260. Peterson, McKinstry, and Dernbach suggest that any reductions that would not be achieved through national technology-based standards or a national cap-and-trade program should be allocated to the states and addressed through a state implementation planning process. Peterson et al., *supra* note 231, at 264.

The issue of *how* to allocate emission reduction responsibilities among the states, particularly in light of the significant disparities in emissions among the states, will present a significant challenge. The disparities do not necessarily represent differences in per capita usage, since some states generate energy (and emissions) on behalf of others. See Kaswan, *Cooperative Federalism*, *supra* note 81, at 836-37 (discussing issues likely to arise in determining each state's reduction responsibility).

The European Union is planning on taking a similar approach for the third phase of its climate change program, slated to begin in 2013. Emissions amenable to control through a European-wide cap-and-trade system, comprising approximately 45% of Europe's emissions, will be handled through a centralized system. See LARRY PARKER, CONG. RESEARCH SERV., CLIMATE CHANGE: THE EU EMISSIONS TRADING SCHEME (ETS) GETS READY FOR KYOTO 1 (2007); COMM'N OF THE EUR. COMMUNITIES, COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, AND THE COMMITTEE OF THE REGIONS 7 (2008), <http://eur-lex.europa.eu/LexUriServ/LesUriServ.do?uri=COM:2008:0030:FIN:EN:PDF>. Responsibility for the remaining emissions will be delegated to each nation within the European Union. *Id.* Each nation state is then responsible for developing an emission reduction plan for the non-trading sector. *Id.*

ample, reductions that could be achieved through VMT reductions or enhanced building standards could be assigned to the states.²³⁶ Relevant aspects of the state implementation process could then be further devolved to the regional or local metropolitan level, which could develop demand-reduction and other emission-reducing policies over sources within their control.²³⁷ The state would then consolidate planned state, regional, and local efforts into a state implementation plan subject to federal oversight.²³⁸

Below, I highlight a few of the many institutional issues that implementing a SIP-like process would raise: (1) the division of responsibility between states and more local levels; (2) devolution to regional agencies versus local governments; and (3) the extent to which certain types of land use or buildings measures should be mandated or left to state and local discretion.

B. The Division of Responsibility Between the State and Local Level

The states must first set the ground rules for regional or local land use and building reforms. For example, they could establish parameters for the types of zoning that are likely to reduce VMT and limit local discretion to

It is possible that determining each state's obligation would be so deeply contested as to paralyze the process. Alternatively, federal legislation could focus on policies and measures that each state is required to adopt, rather than setting state-specific emission-reduction targets.

236. Determining the reductions attributable to the national government and those attributable to the state and local level will present important challenges given the potential overlap among the categories. For example, a national policy could address reductions from the nation's utilities, with the expectation that national requirements would be met through a combination of technology improvements, fuel-switching, investment in alternative fuels, and utility-driven demand management strategies. Utilities' emissions, however, will also be impacted by state and local demand-reduction measures, like building standards. Thus, conceivably, a national emissions goal for utilities should assume, and subtract, the emissions reductions to be achieved through state and local initiatives. *See* McKinstry et al., *supra* note 122, at 5. It is also possible that the full emission reduction targets could be allocated to the states, who would then incorporate into their implementation plans not only their own efforts, but also federal programs contributing to their efforts. That approach would be similar to the Clean Air Act, which requires states to meet the National Ambient Air Quality Standards, but assumes that progress toward the standards will be achieved through both state controls and federal programs such as the federal requirements on stationary sources and automobiles.

237. In addition to demand-reduction policies, localities could reduce emissions from municipal operations, including those from municipal buildings, vehicle fleets, and landfills, and facilitate renewable energy sources. *See, e.g.,* Healy, *supra* note 148, at 421.

238. Legislators may want to consider federal oversight models that are somewhat less burdensome than the existing oversight over state implementation plans under the Clean Air Act, which requires federal approval of every change.

adopt sprawl-inducing ordinances and engage in exclusionary zoning.²³⁹ States could also indirectly impact the factors that lead municipalities to zone for sprawl by providing local governments with greater resources to finance essential services, such as schools, and by reducing local governments' financial reliance on property taxes.²⁴⁰ States' transportation policies could foster compact development and public transit to disfavor sprawl. On the buildings front, states could adopt more stringent minimum energy codes and provide financing for local energy efficiency efforts.

But statewide measures can go only so far. After adopting appropriate reforms at the state level, the states should delegate specific emission-reduction responsibilities to each metropolitan region²⁴¹ and allow individual regions and cities to adopt and implement the land use and buildings policies necessary to meet the state-set targets. The state would then oversee and approve local implementation plans to ensure regional and local compliance.²⁴²

Devolution from the state to the local level is appropriate in light of the unique advantages of local control.²⁴³ As discussed above, municipal land use patterns are key causes of GHG emissions, and local entities are well positioned to address them in light of their existing land use authority, their knowledge of local circumstances and opportunities, their ability to include

239. Professor Levine observes that commentators concerned about municipalities' failure to engage in smart growth frequently focus only on regional regulation rather than addressing states' limitations on municipalities' ability to preclude dense development. LEVINE, *supra* note 32, at 43.

240. *See id.* at 74-75. If local governments were less dependent upon property taxes, they could be more likely to allow denser development and more affordable housing.

241. Determining the appropriate emissions budget for each locality is likely to be as difficult as determining the appropriate emissions budget for each state. *See* SALON & SPERLING, *supra* note 203, at 5-6 (evaluating several options for determining local budgets).

To address the connection between land use, VMT, and GHG emissions, California recently passed legislation that will require the California Air Resources Board to establish regional emission reduction targets for transportation. S.B. 375 § 4, 2007-2008 Reg. Sess. (Cal. 2008) (amending CAL. GOV'T CODE § 65080(b)(2)(A) (West 2008)). Each region will be required to develop a Sustainable Communities Strategy that outlines the development and land use patterns it will use to achieve the required reductions. *Id.*

242. States have adopted similar approaches to address other local decisions with state-wide implications. For example, California requires cities and counties to adopt general plans that address their fair share of regional housing need. *See* DIV. OF HOUS. POL'Y DEV., CAL. DEP'T OF HOUS. & CMTY. DEV., STATE HOUSING ELEMENT LAW, <http://www.hcd.ca.gov/hpd/hrc/plan/he/heoverview.pdf> (last visited Nov. 20, 2008). The state identifies each region's share of the state's housing need and allocates that share to a regional planning organization. The planning organization develops a plan that in turn allocates the regional need to the region's cities and counties. The California Department of Housing and Community Development ultimately reviews each local general plan. *Id.*

243. *See* Briffault, *supra* note 167, at 1168 (arguing that key land use decisions should be made at the regional rather than the state level).

the participation of and be accountable to the citizens who will be affected by any adopted measures, and the benefit of allowing a diversity of approaches that could be models (good and bad) for other jurisdictions to follow (or avoid).²⁴⁴ By distributing the duty to reduce emissions, a state would also be more likely to distribute the co-benefits of GHG emission reductions, such as reductions in air pollution.²⁴⁵ Moreover, as a political matter, legislation to improve land use planning is unlikely to succeed if it strips local governments of their historic powers.²⁴⁶ The practical challenges of tracking, coordinating, and guiding local action at the federal and state levels are outweighed by the benefits that local control could offer.²⁴⁷ The critical issue of local governments' political will to reform—and the implications for the necessary balance between mandate and discretion—is discussed below.

California recently adopted legislation that could provide a national model. In order to encourage statewide reductions in VMT and increase incentives for land use reforms, the legislation requires the California Air Resources Board to set a statewide goal for reducing VMT-generated vehicular emissions and then set regional reduction targets that distribute responsibility to each of California's municipal areas.²⁴⁸ Metropolitan Planning Organizations ("MPOs") in each region, already tasked with transportation planning responsibilities, will be required to develop a Sustainable Communities Strategy that outlines the regional development and land use patterns that would achieve the required reductions.²⁴⁹ California's law suggests the potential viability of state-delegated VMT-reduction obligations.

In the buildings context, devolution from the state to local level may be less imperative. As discussed above, building standards implicate fewer local socioeconomic and political considerations than land use provisions, and statewide consistency may have a greater value than in the land use context. Nonetheless, even if a state chooses to enact strict statewide building standards, local governments could be given the option of meeting regional or local greenhouse reduction goals through enhanced local stan-

244. See generally Griffith, *supra* note 102, at 1030-31 (describing the benefits of local implementation of smart growth initiatives in light of local expertise and accountability).

245. Kaswan, *Environmental Justice*, *supra* note 85, at 10302.

246. See Buzbee, *supra* note 53, at 103-04 (observing that federalism norms favoring local power are a "political reality").

247. See Stewart, *supra* note 142, at 701.

248. S.B. 375 § 4, 2007-2008 Reg. Sess. (Cal. 2008) (amending CAL. GOV'T CODE § 65080(b)(2)(A) (West 2008)).

249. *Id.*

dards.²⁵⁰ Local governments required to meet local emission reduction goals could appreciate the flexibility of choosing from an array of land use and buildings strategies.

C. Devolution to the Regional or Local Level?

A critical and controversial issue for any planning strategy is the relative role of regional entities and local governments. At least with respect to the land use and transportation components of a state's emission reduction strategy, a regional planning role appears imperative.²⁵¹ Initial emission-reduction obligations could be delegated to regional entities, who could work with local governments and citizens to engage in a regional land use planning effort that sets regional goals and establishes a general blueprint for channeling regional growth and meeting regional needs.²⁵² California's SB 375 has taken this approach by requiring the implementing state agency to assign transportation-emission reduction obligations and associated planning responsibilities to regional MPOs, entities that already engage in transportation planning.²⁵³

Regional planning would combat localities' tendency to serve parochial rather than regional interests and allow for a more rational approach to the inevitable spillover effects of local decisions in interconnected regions.²⁵⁴ Particularly in the land use context, local decisions have regional impacts.²⁵⁵ One suburb's decision to allow low-density sprawling develop-

250. Cf. CPUC PLAN, *supra* note 74, at 82 (stating that local governments could help achieve energy efficiency by developing building codes that exceed the state's already-strict energy code). On the importance of not preempting stricter state and local standards, see William W. Buzbee, *Asymmetrical Regulation: Risk, Preemption, and the Floor Ceiling Distinction*, 82 N.Y.U. L. REV. 1547 (2007) [hereinafter Buzbee, *Asymmetrical Regulation*]; Kaswan, *Cooperative Federalism*, *supra* note 81, at 798-803.

251. See, e.g., Griffith, *supra* note 102, at 1019 (arguing for a regional approach to achieve smart growth).

252. This approach is similar to the "blueprint" planning process underway in the Sacramento region, see *supra* notes 187-91 and accompanying text, and to the planning process for VMT reduction established by S.B. 375. See *supra* note 241 and accompanying text.

253. See Darrel Steinberg, *SB 375 Connects Land Use and AB 32 Implementation*, PLAN. REP., July 2007, available at http://www.planningreport.com/tpr/?module=displaystory&story_id=1257&edition_id=92&format=html.

254. See Briffault, *supra* note 167, at 1132-33, 1164 (arguing that local government decisions have spillover impacts that local governments fail to consider); Buzbee, *supra* note 53, at 91 (observing that, although local governments make land use choices, "sprawl arises out of dynamics, causes, and effects that tend, at a minimum, to be regional"); Griffith, *supra* note 102, at 1026-27 (describing regional nature of sprawl). See also Steinberg, *supra* note 253 (quoting the S.B. 375's author's statement that "we need to plan as a region, not just as individual cities and counties" due to the regional nature of air quality, congestion, and climate change concerns).

255. See Briffault, *supra* note 167, at 1133-36.

ment creates congestion in neighboring communities while forcing new development ever farther from the metropolitan core. Suburban zoning decisions that preclude affordable housing force low-paid workers to commute long distances to suburban employment centers. Fundamentally, given the flow of residents between local communities as they travel between work, home, and school, individual municipalities do not have control over the overarching land use and transit patterns that impact VMT. In addition, a regional approach could reduce competition between communities within a region, lessening the race to the bottom and the fear of leakage that could otherwise impede desirable local action. As a practical matter, public transportation systems are likely to be more effective if developed on a comprehensive regional basis than on a municipal basis.²⁵⁶ As noted above, California could provide a partial model for regional planning to reduce VMT: the state recently enacted legislation that assigns VMT-reduction targets to metropolitan regions and requires regional MPOs, already established for transportation planning purposes, to develop an overarching regional land use plan.²⁵⁷

While regional planning is necessary to address the regional consequences of local land use decisions, creating fair and effective regional governance poses numerous challenges. At present, regional planning entities generally have little direct authority; cities retain primary control over basic land use and transportation decisions.²⁵⁸ Unless regional entities are given greater power, they risk expending significant resources in planning efforts that could ultimately fail to be implemented by the local governments who have actual authority.²⁵⁹

Giving regional entities full land use power or creating regional governments is, however, highly controversial and is unlikely to be implemented given the political opposition of local governments to ceding governing authority.²⁶⁰ Conceivably, however, climate change legislation could give

256. See Griffith, *supra* note 102, at 1026.

257. See Steinberg, *supra* note 253; see also *supra* notes 248-49 and accompanying text.

258. See SALON & SPERLING, *supra* note 203, at 4.

259. In light of these concerns, Deborah Salon and Daniel Sperling have proposed allocating carbon emissions budgets to cities and giving each city the discretion to determine how best to meet its budget. See *id.* at 4. In contrast, a regional planning effort in Sacramento, California appears to be successfully translating regional plans into local government implementation actions. See Sacramento Region Blueprint, <http://www.sacregionblueprint.org/sacregionblueprint/home.cfm> (last visited Jan. 23, 2009). Local governments in the Sacramento context may have been inspired to participate by projections that, without the regional controls, congestion and air quality would become even more severe than the adverse conditions already experienced. See Campoy, *supra* note 187, at A1.

260. See Briffault, *supra* note 167, at 1149, 1165. The League of California Cities initially opposed S.B. 375 due to its impact on local control, see Steinberg, *supra* note 253, but

general planning authority to a regional entity but then empower the regional entity to further assign emission-reduction obligations to the local level.²⁶¹ Local governments would then develop more refined city-specific land use, buildings, and other strategies to meet their local targets. As discussed further below, regional governments should be given sufficient mechanisms, whether incentives or penalties, to induce local governments to follow the regionally-established land use, transportation, and buildings parameters and to meet their local targets.²⁶² Although this approach would necessarily diminish local government prerogatives, such diminishment is necessary to achieve critical land use reforms.

As regional institutions become increasingly powerful, with increased planning responsibilities and enhanced authority to induce local compliance, they must ensure democratic accountability through adequate representation of affected populations and vigorous public participation requirements.²⁶³ Regional entities have not always met these goals. For example, in the transportation planning context, MPOs that give an equal vote to each municipality, regardless of size, provide suburban interests with a disproportionate role relative to the population and interests they represent.²⁶⁴ The views of a large central city could be outweighed by the

ultimately endorsed the bill. See League of California Cities, Issues & Legislation, http://www.cacities.org/index.jsp?displaytype=11&story=27392&zone=locc§ion=issues&sub_sec=issues_enviro&tert=issues_enviro_cominfo# (last visited Jan. 23, 2009).

Scholars have vigorously debated the value and potential shape of regional institutions. See, e.g., Briffault, *supra* note 167. A full exploration of the issue is beyond the scope of this Article.

261. See generally Briffault, *supra* note 167, at 1165-66 (advocating for a regional approach to land use that would nonetheless honor the “subsidiarity” principle, in which decisions would be left to local governments wherever possible).

262. See LEVINE, *supra* note 32, at 194 (describing incentives that regional entities could use to induce local governments to permit compact development). S.B. 375 includes carrots to induce local government compliance. The MPO’s transportation planning and funding decisions must be consistent with the sustainable communities strategy (“SCS”), and so inconsistent transportation projects would not receive funding. In addition, development projects consistent with the SCS are entitled to streamlined environmental reviews. See Memorandum from Bill Higgins, Legislative Representative & Sr. Staff Attorney, to California City Officials 12-13 (Sep. 19, 2008), available at [http://cacities.org/resource_files/27223.SB%20375%20Implementation%20Final%209-19-08\(1.1\).pdf](http://cacities.org/resource_files/27223.SB%20375%20Implementation%20Final%209-19-08(1.1).pdf). It remains to be seen, however, whether these carrots will be sufficient to induce local governments to engage in land use planning that is consistent with the SCS. Stronger incentives, like conditioning additional sources of federal funding or state approvals on compliance with the SCS, may be necessary.

263. Some regionalism advocates propose that regional entities be representative, elected, bodies rather than agencies staffed by appointed officials. See Briffault, *supra* note 167, at 1166-67; Griffith, *supra* note 102, at 1031-34.

264. Pursuant to federal transportation statutes, MPOs in many urban regions engage in comprehensive regional transit planning. See Thomas W. Sanchez & James F. Wolf, *Envi-*

multiple representatives of many small suburban communities, even if the city represents a much larger population than the suburban areas. Regional institutions responsible for developing an emission reduction blueprint must ensure that they adequately represent and are accountable to the affected populations, and not simply the affected local governments. As discussed further below, regional entities also need to incorporate broad public participation provisions to ensure input, particularly from groups who have historically been underrepresented in land use decision-making processes.²⁶⁵

D. Mandates or Discretion?

The state implementation planning process under the Clean Air Act, while certainly not unfettered, has left states with considerable discretion in how to meet air quality standards, particularly with respect to land use control measures. Most states have not chosen to reduce emissions through land use control efforts.²⁶⁶ That deficit is likely attributable to the myriad economic, political, and social obstacles to local smart growth and other green initiatives discussed above. If states and local governments are left with full discretion, these obstacles are likely to continue to impede change.

Federal law should therefore mandate that states require local or regional institutions to meet their emission reduction obligations through land use and other demand reduction efforts.²⁶⁷ At the same time, imposing precon-

ronmental Justice and Transportation Equity: A Review of MPOs, in GROWING SMARTER, *supra* note 220, at 249, 251. The MPOs generally include one representative of each local government within the metropolitan area, giving more weight (in relation to population) to suburban communities than to core cities. *Id.* at 255, 265. As a consequence, suburbs, which are generally whiter and richer than core cities, have a greater voice in establishing regional transportation plans than urban centers. See Robert D. Bullard, *Smart Growth Meets Environmental Justice*, in GROWING SMARTER, *supra* note 220, at 35-36.

265. See Buzbee, *supra* note 53, at 96-98; see *infra* notes 294-300 and accompanying text (discussing importance of participation in regional decisionmaking entities).

266. See Doremus & Hanemann, *supra* note 84, at 829-30; see also EWING ET AL., *supra* note 13, at 136 (observing that “land use and transportation demand management policies generally have not played a significant role in meeting” local air pollution reduction goals). In light of its extreme air pollution, San Joaquin County is one of the few areas in the country to have incorporated land use measures in its SIP. See Carolyn Whetzel, *San Joaquin Valley Air District Adopts Rules to Cut Pollution from Developers, Wineries*, 36 ENV'T REP. 2653 (2005). Developers of large new projects must incorporate land use or building design strategies to reduce emissions or pay mitigation fees that would be used to fund other air pollution reduction activities. *Id.*

267. See Doremus & Hanemann, *supra* note 84, at 829; cf. Salkin, *supra* note 20, at 825 (suggesting that states may need to mandate intergovernmental cooperation in order to overcome “strong home rule cultures in many jurisdictions”). Professor William Buzbee insightfully analyzes the political issues raised by varying levels of mandate and discretion in

ceived and inflexible requirements on regional and local governments would eliminate all the advantages of local government knowledge, fail to adjust to the significant differences among localities, eliminate the democratic advantages of local control, and deprive the nation of the opportunity to explore a variety of approaches.²⁶⁸ It is also likely to create a strong political backlash.²⁶⁹ Without attempting to draw the line between mandate and discretion, it is clear that some combination of the two will be necessary.

Mandates to eliminate sprawl-inducing zoning provisions and promote more compact development may raise the specter of government run amok, forcing unwanted change on individuals and interfering with the housing market. While it is true that mandates would interfere with local governments' exclusionary zoning, studies suggest that eliminating low-density zoning requirements and allowing more compact development would better serve consumer demand for more compact communities,²⁷⁰ demand that is now frustrated by existing zoning restrictions.²⁷¹ A survey of developers has found that they believe there is a strong market for compact development and that local zoning limitations prevent them from building to their desired density.²⁷² From a regional perspective, then, "interfering" with existing local land use laws may help overcome systemic barriers that have poorly served much of the population.

VI. A COMPREHENSIVE SOCIOECONOMIC APPROACH TO LAND USE

Just as no single level of government can, by itself, revolutionize urban form, an exclusive focus on urban form will not succeed in addressing the underlying causes of sprawl.²⁷³ The essential land use planning ahead cannot focus solely on mechanical increases in density and rolling out the next

federal programs designed to induce state and local action through conditional federal spending. See Buzbee, *supra* note 53, at 117-24.

268. See *supra* notes 165-72 and accompanying text (describing advantages of local control).

269. See Buzbee, *supra* note 53, at 124 (observing that strict requirements that could result in sanctions are likely to be politically unpopular); Salkin, *supra* note 20, at 814 (noting that "purely regulatory solutions to planning and development problems" generate "strong opposition"); see also SALON & SPERLING, *supra* note 203, at 11 (observing that local governments should be provided with "carrots" rather than "sticks" so that they become partners rather than adversaries).

270. See EWING ET AL., *supra* note 13, at 23-27.

271. See LEVINE, *supra* note 32, at 51-53 (describing limits imposed by existing zoning).

272. *Id.* at 127-28 (describing developer interest in compact development and their perception that municipal regulations impede such development).

273. See Buzbee, *supra* note 53, at 60 (arguing that sprawl cannot be successfully abated without addressing its social, market, and legal causes).

bus line: it must take into account the associated sociopolitical and cultural dimensions of the challenge. An integrated planning process would recognize land use policy as social policy, and, to the extent possible, explicitly incorporate and address demand-reduction policies' socioeconomic implications and potential.²⁷⁴ Such an approach is necessary not only to ensure the success of VMT reduction; climate change-driven land use reforms create an opportunity to address underlying inequities and dysfunctions in the land use system.

The emerging regional equity movement provides a roadmap for comprehensive urban development that integrates environmental, economic, and social parameters. The movement advocates reducing "disparities in transportation, housing, economic opportunity, land use, infrastructure, education, environmental justice, and health."²⁷⁵ Similar goals have been articulated as part of the "smart growth" movement,²⁷⁶ as well as in the sustainable development literature focused on sustainable communities.²⁷⁷

A. The Importance of Socioeconomic Factors in Achieving VMT Reductions

As noted above, current land use patterns are, in part, a consequence of past and present discrimination. The legacy of separation cannot be overcome without addressing the underlying social and economic causes of the

274. Urban development legislation has attempted to encourage integrated planning, but has often failed to achieve its goals. See Green, *supra* note 232, at 112-13 (describing, for example, the Housing and Urban Development Act of 1970); see also Salsich, *supra* note 207, at 487-90 (discussing federal housing and community development laws that encouraged comprehensive equity-based land use planning as a precondition to receiving grant money). Some communities have undertaken such integrated planning on their own. See Dernbach & Bernstein, *supra* note 230, at 503 (describing local sustainable development planning initiatives that integrated a wide variety of socioeconomic, environmental, and participatory concerns).

275. See Robert D. Bullard, *Introduction*, in GROWING SMARTER, *supra* note 220, at 1, 5; see also ANGELA GLOVER BLACKWELL & SARAH TREUHAFT, REGIONAL EQUITY AND THE QUEST FOR FULL INCLUSION 2 (2008), available at <http://www.policylink.org/Events/documents/FramingPaper08.pdf>.

276. See Salkin, *supra* note 20, at 789-90 (listing the American Planning Association's description of smart growth, which incorporates environmental and economic factors, including the need for greater equity). Notwithstanding the American Planning Association's inclusive definition of smart growth, some have critiqued the movement for focusing primarily on environmental issues with little consideration of racial and social equity. See Bullard, *supra* note 275, at 3; see also Salkin, *supra* note 20, at 825 (stating that affordable housing and "social equity must be a bigger part of the smart growth discussion").

277. See Dernbach & Bernstein, *supra* note 230, at 495-99.

urban/suburban divide.²⁷⁸ Professor Roisman stresses the importance of continuing efforts to address racial and economic bias.²⁷⁹

More concretely, sprawl is unlikely to be mitigated, and central cities unlikely to be repopulated with middle- and upper-income residents, unless urban services improve.²⁸⁰ For example, middle- and upper-income families are unlikely to move to the central city without profound improvements in school quality.²⁸¹ That raises a “chicken and egg” problem: without wealthier residents and businesses, cities cannot afford to improve services, but without the improved services, they cannot attract revenue-generating residents and businesses. Federal, state, and regional strategies to promote infill development to reduce emissions thus need to consider not only their immediate objectives, but a broader socioeconomic agenda that addresses the resources deficit in struggling urban centers.²⁸²

While improving urban services to encourage middle-class infill is critical, infill policies that simply displace poor residents would be counterproductive from both a social justice and VMT-reduction perspective. Infill policies focused on adding new housing rather than replacing existing housing are less likely to pose this risk.

Socioeconomic considerations are critical to the development path within suburbs as well as cities. For example, to alleviate the long commutes of lower-paid workers in suburban settings, VMT-reduction strategies must address the lack of affordable housing in suburbs.²⁸³ Policies that not only encourage greater infill and density, but also include affordability requirements, could enable low-wage workers to live closer to employment centers. In order to induce suburbs to give up exclusionary zoning, states will have to address the system of financing local services that drives exclusionary fiscal zoning.²⁸⁴

278. See *supra* notes 203-22 and accompanying text.

279. See Roisman, *supra* note 105, at 112.

280. See *id.*

281. As Professor Bullard notes, school quality plays a central role in family locational decisions. Bullard, *supra* note 264, at 33.

282. A full elaboration of possible strategies is beyond the scope of this Article. Measures could, however, include state or federal requirements that local jurisdictions share a greater portion of their tax revenue for regional or statewide purposes. See Myron Orfield, *Building Regional Coalitions Between Cities and Suburbs*, in *GROWING SMARTER*, *supra* note 220, at 323, 325-31.

283. See Salsich, *supra* note 207, at 463-65 (observing that low-density single-use suburban zoning presents a significant obstacle to the provision of affordable housing); *id.* at 498 (noting that “the growing disparity between job opportunity and affordable housing availability is a matter of national concern”).

284. See *supra* notes 204-06, 239 and accompanying text.

B. Beyond Demand Management: Achieving Regional Equity

Reducing VMT is not the only justification for incorporating regional equity goals into climate change policy. Decisions to address emissions inevitably implicate a wide range of economic and social factors. Addressing only one facet of a multi-faceted venture is simply poor decisionmaking. For example, in the land use context, increased VMT is only one of sprawl's many adverse consequences.²⁸⁵ A holistic recognition of land use regulation's impacts could lead to more productive and effective reforms.²⁸⁶ Climate change policies promoting land use reform could thus provide a vehicle for creating more effective and more equitable urban infrastructures that enhance municipal services, increase opportunities for the disadvantaged, and improve quality of life.²⁸⁷ Since these goals are consistent with, and in some cases necessary to, the success of demand-reduction measures, the opportunity is one to be taken.

While this is not the place to fully explore and defend the concept of regional equity as an important component of land use policy, I note that scholars are increasingly recognizing that greater equity would benefit not only the urban underclass, but entire metropolitan regions.²⁸⁸ Contrary to the assumptions of some suburbanites that they have insulated themselves from the problems of the urban core, recent studies have shown that the economic, social, and environmental health of the suburbs often track the core's well-being.²⁸⁹ The pursuit of regional equity is thus justified not only in redistributive terms, but as a mechanism for enhancing entire metropolitan regions, both core and suburb.

285. See, e.g., Buzbee, *supra* note 53, at 69-75 (describing sprawl's adverse consequences); Ziegler, *supra* note 16, at 37-45 (same).

286. While some argue that the imperatives of climate change demand an exclusive focus on measures to reduce greenhouse gas emissions, I argue that climate change policies can and should address a broader agenda. See Kaswan, *Environmental Justice*, *supra* note 85, at 10287-88. The regional equity movement calls for considering the equity impacts at the "front end" of political processes and ensuring "that disadvantaged communities participate in and benefit from decision that determine the course of development in their neighborhoods, communities, and regions." BLACKWELL & TREUHAFT, *supra* note 275, at 2.

287. In addition, to the extent that policymakers question the wisdom of encouraging compact growth as a climate change strategy due to uncertainties as to its effectiveness in reducing VMT, see *supra* notes 42-66 and accompanying text, considerations like creating affordable housing near job centers and improving quality of life provide additional justifications for reforming land use policy. See LEVINE, *supra* note 32, at 47-48, 185-86.

288. See, e.g., Buzbee, *supra* note 53, at 131 (arguing that all localities in a region ultimately recognize the value of a municipal region that offers essential services).

289. See Briffault, *supra* note 167, at 1137-40; Roisman, *supra* note 105, at 90-96; Powell, *supra* note 220, at 54.

An integrated approach is desirable from a practical as well as a theoretical perspective. While integrated planning may appear more complicated than single-issue planning, planning officials may find an integrated approach more, not less, efficient than a multiplicity of separately mandated, yet intrinsically interconnected planning exercises. Emission reduction plans impacting urban form require decisions about the location of housing, workplaces, and infrastructure, decisions that are fundamentally interrelated. Developing separate plans could lead to disjointed and inefficient results.²⁹⁰

Regional equity goals can be integrated into land use planning efforts through a wide variety of mechanisms that both reduce environmental impacts and address social equity considerations.²⁹¹ Green building programs could also integrate regional equity goals by channeling employment opportunities to communities in need. For example, they could develop green jobs programs that train unemployed residents to engage in energy efficiency retrofits and weatherization.²⁹²

C. Meaningful Participation

A top-down requirement that relevant officials consider the full array of socioeconomic implications of land use and other climate policies is unlikely to be effective.²⁹³ A key attribute of local planning is its ability to include the participation of community members in planning efforts.²⁹⁴ That participation risks, however, simply replicating the existing power structures within metropolitan areas.²⁹⁵ Federal or state legislation designed to encourage smart growth measures should therefore include par-

290. The League of California Cities lauded S.B. 375's integration of land use, transportation, and housing planning, noting that it helped overcome the "long-standing issue" of "single-purpose state agencies." See Memorandum from Bill Higgins, *supra* note 262, at 3.

291. Blackwell and Treuhaft suggest such strategies as transit-oriented development, inclusionary zoning, and incentives to coordinate employment and affordable worker housing. See BLACKWELL & TREUHAFT, *supra* note 2755, at 3.

292. See *id.* at 7 (arguing that the "growing green economy" should be linked "to the renewal of low-income communities"); see also Maxine Burkett, *Just Solutions to Climate Change: A Climate Justice Proposal for a Domestic Clean Development Mechanism*, 56 BUFF. L. REV. 169, 223-27 (discussing potential for green-collar jobs); Kaswan, *Environmental Justice*, *supra* note 85, at 10311 (discussing the potential for domestic climate change policies to channel green development opportunities to disadvantaged communities).

293. See Dernbach & Bernstein, *supra* note 230, at 500.

294. See *id.* at 509 (describing importance of public participation).

295. See Buzbee, *supra* note 53, at 135.

ticipation requirements that will ensure sufficient representation of traditionally underprivileged groups in planning efforts.²⁹⁶

The issue of devolving authority to regional versus local entities must also grapple with the socioeconomic implications of that choice. Vesting authority in local entities could undermine change if suburban exclusionary impulses continue to govern and smart growth and affordable housing incentives are insufficient to overcome them. A regional focus could have more potential to incorporate the interests of an entire region, including the urban core. However, regional decision-making processes risk being overly insulated from public participation and control,²⁹⁷ or, alternatively, unequally representing the communities over which they have jurisdiction. Past regional transportation planning efforts have given suburban interests a proportionately greater voice.²⁹⁸ Regional planning efforts must therefore ensure sufficient participation to be responsive to the public, and be designed to elicit the meaningful participation of groups that have historically been underrepresented in decision-making fora.²⁹⁹

Achieving integrated planning thus requires climate change policymakers developing VMT reduction or green building strategies to consider not only the mechanics of changing urban form, but broader considerations including affordable housing, municipal services, transit equity, and meaningful participatory structures. The broader the goals, the broader the necessary expertise, the broader the potentially affected constituencies, and the

296. As Professor Bullard has stated, “if poor people and people of color are not at the table when plans are developed or decisions are made, their interests may not be well served.” Bullard, *supra* note 2644, at 25. They therefore need a seat at the table, and they “must be heard and respected, and their vision must be acted on before real change takes hold.” *Id.* at 25; *see also* BLACKWELL & TREUHAFT, *supra* note 2755, at 9 (emphasizing the importance of meaningful participation in decisionmaking).

297. *See* Buzbee, *supra* note 53, at 134 (stating that “[i]f democratically unaccountable regional authorities become the main venue for review of regional decisions influencing sprawl, the public’s voice is particularly likely to go unheard”).

298. In the transportation planning context, certain regional planning efforts have been plagued with concerns about the adequacy of community representation. Pursuant to federal transportation statutes, MPOs in many urban regions engage in comprehensive regional transit planning. *See* Sanchez & Wolf, *supra* note 264, at 251. The MPOs generally include one representative of each local government within the metropolitan area, giving more weight (in relation to population) to suburban communities than to core cities. *Id.* at 255, 265. As a consequence, suburbs, which are generally whiter and richer than core cities, have a greater voice in establishing regional transportation plans than urban centers. *See* Bullard, *supra* note 2654, at 35-36; *see also supra* notes 264-2655 and accompanying text.

299. Ironically, such expectations could make regional approaches less politically viable. Those in power in particular local jurisdictions tend to resist new governance forms that could jeopardize that power. *See* Griffith, *supra* note 102, at 1043 (noting that, in light of Atlanta’s racial politics and segregated structure, existing municipalities are unwilling to “cede power” to a regional government entity).

greater the potential for conflicts and tensions. Unless there is sufficient local political pressure, state and local governments considering land use and other institutional changes may fail to incorporate regional equity goals in land use plans designed to reduce VMT.³⁰⁰ To achieve regional equity—or any other non-emission related goals—federal or state laws designed to reduce VMT will need to include specific parameters that require local or state planning efforts to incorporate equity considerations.³⁰¹

CONCLUSION

Ultimately, if federal climate change legislation continues to focus primarily on smokestacks and tailpipes it will fail to address the underlying cause of most emissions: consumption. While federally-proposed market-based mechanisms could indirectly induce some reductions in consumption, the market is an imperfect tool for stimulating the necessary changes in the built environment. To address consumption, the nation needs to directly address its land use and buildings policies.

Cities can play a vital role in that process. But notwithstanding the tremendous surge in local climate change activity, with smart growth initiatives and green building ordinances abounding, reliance on piecemeal urban initiative is unlikely to be sufficient. Federal climate legislation should create a vertically integrated framework for requiring states to take responsibility for reducing statewide consumption and, as appropriate, delegating that responsibility to the regional or local level. In light of the complexity of the political, economic, and social factors lying behind land use policy, federal legislation must also, to the extent possible, attend to the socioeconomic preconditions for successful land use reform. Finally, climate change legislation has its silver lining: by re-opening fundamental institutions, like urban structure, it provides an opportunity to integrate a regional equity approach that would not only reduce VMT, but redress the deeper ills that our sprawling legacy has produced.

A single federal climate change bill is unlikely to incorporate all of the elements necessary to reform land use and building practices. Rather, fed-

300. Given power imbalances in some regions, it is quite conceivable that the poor and disadvantaged who would most benefit from regional equity principles would be the least politically powerful, and the least able to incorporate such goals in planning efforts.

301. Local and regional institutions could work with and draw upon the civic organizations attempting to integrate environmental, social justice, and sustainability concerns. Such organizations include, for example, the Apollo Alliance, a coalition of business, labor, and environmental groups promoting green jobs, and Policy Link, a national institute advancing economic and social equity. *See generally* Apollo Alliance, <http://apolloalliance.org/> (last visited Jan. 23, 2009); Welcome to PolicyLink, <http://www.policylink.org> (last visited Jan. 23, 2009).

eral and state laws addressing transportation,³⁰² tax structures,³⁰³ community development,³⁰⁴ schools, affordable housing, and appliance and building energy standards³⁰⁵ may all play a role in encouraging the proposed land use and building changes. Moreover, state laws governing utilities,³⁰⁶ land-use planning,³⁰⁷ and the relative power of regional versus local governments are critical.³⁰⁸ Notwithstanding the complexity of these component parts, federal climate change legislation that recognizes the critical role of consumption—and the importance of redirecting land use and building policies to reduce consumption—would set the nation on a more realistic course toward achieving its climate change goals.

302. For example, the federal government's transportation programs could re-orient transportation funding from highways to transit, *see* BROWN ET AL., *supra* note 11, at 48-49, include performance standards and incentives to reduce VMT, and set standards for localities to qualify for federal transportation funding. *See* Bartholomew, *supra* note 48; Buzbee, *supra* note 53, at 125-26; *see also* EWING ET AL., *supra* note 13, at 130-36.

303. Tax policies could create tax credits or deductions for energy efficiency improvements. *See* Dernbach, *supra* note 2, at 10018-19. As discussed above, states could consider more equitable financing of local services to reduce the incentives to engage in exclusionary zoning. *See supra* note 239 and accompanying text.

304. On the community development front, the National League of Cities has proposed federal community block grants to further energy efficiency and smart growth efforts in disadvantaged communities that are unlikely to have sufficient capital. National League of Cities, Energy Efficiency and Conservation Block Grant, <http://www.nlc.org> (search "energy efficiency and conservation block grant") (last visited Jan 23, 2009).

305. Such efforts would include not only the standards themselves, but mechanisms to facilitate consumer access to information about appliance and building energy use, information that would enhance the efficacy of market-based approaches. *See* Dernbach, *Harnessing Individual Behavior*, *supra* note 10, at 147-49.

306. Utilities would have a greater incentive to invest in demand-management programs if utility profits were decoupled from energy generation, *see supra* note 114 and accompanying text, if alternative rate structures were designed to encourage conservation, and if utilities were permitted to invest directly in energy efficiency measures, especially for poor residents, rather than investing in power plants.

307. States whose land use laws preclude smart growth zoning could revise state law to allow or encourage sprawl-constraining land use reforms. *See* Dernbach & Bernstein, *supra* note 230, at 520 (suggesting reform); *id.* at 511 (noting that some states' zoning laws require local governments to engage in single-use zoning). Many, but not all, states have already adopted such reforms. *See id.* at 511-12; *see also* Salkin, *supra* note 20, at 790-821 (describing state smart growth programs); *id.* at 835-36 (describing potential state measures to encourage local smart growth).

308. *See* Dernbach & Bernstein, *supra* note 230, at 520; *see also* EWING ET AL., *supra* note 13, at 141-42.